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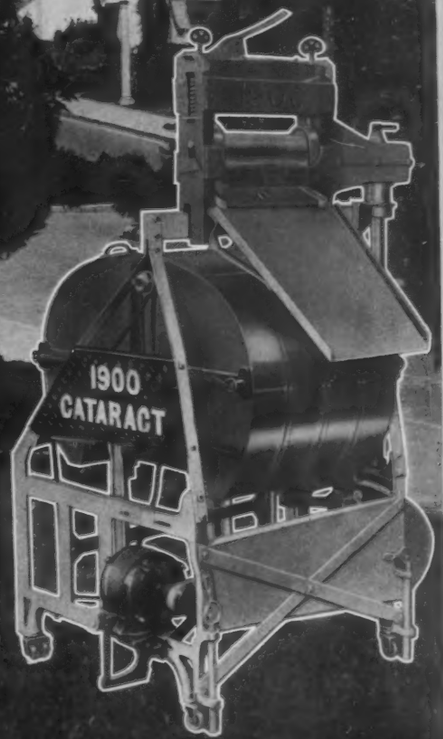

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Journal of Electricity and Western Industry

A semi-monthly chronicle of western events, advocating the economy, efficiency and convenience of electric power for all industries of the West—manufacturing, agricultural, mining, merchandising, home building and home making. Interpreting the value of electrical development to the business and financial man, the industrial man, the power man, wholesaler and retailer, contractor and constructor, engineer and home owner.

Because of the abundance of water power in the West susceptible of economical development, a dependable, uninterrupted supply of cheaper electric power is assured for these industries. The basic industry of the West—hydro-electric power generation—for which Journal of Electricity and Western Industry is the spokesman, is therefore logically and inseparably linked to the growth and prosperity of all phases of our daily life and business.

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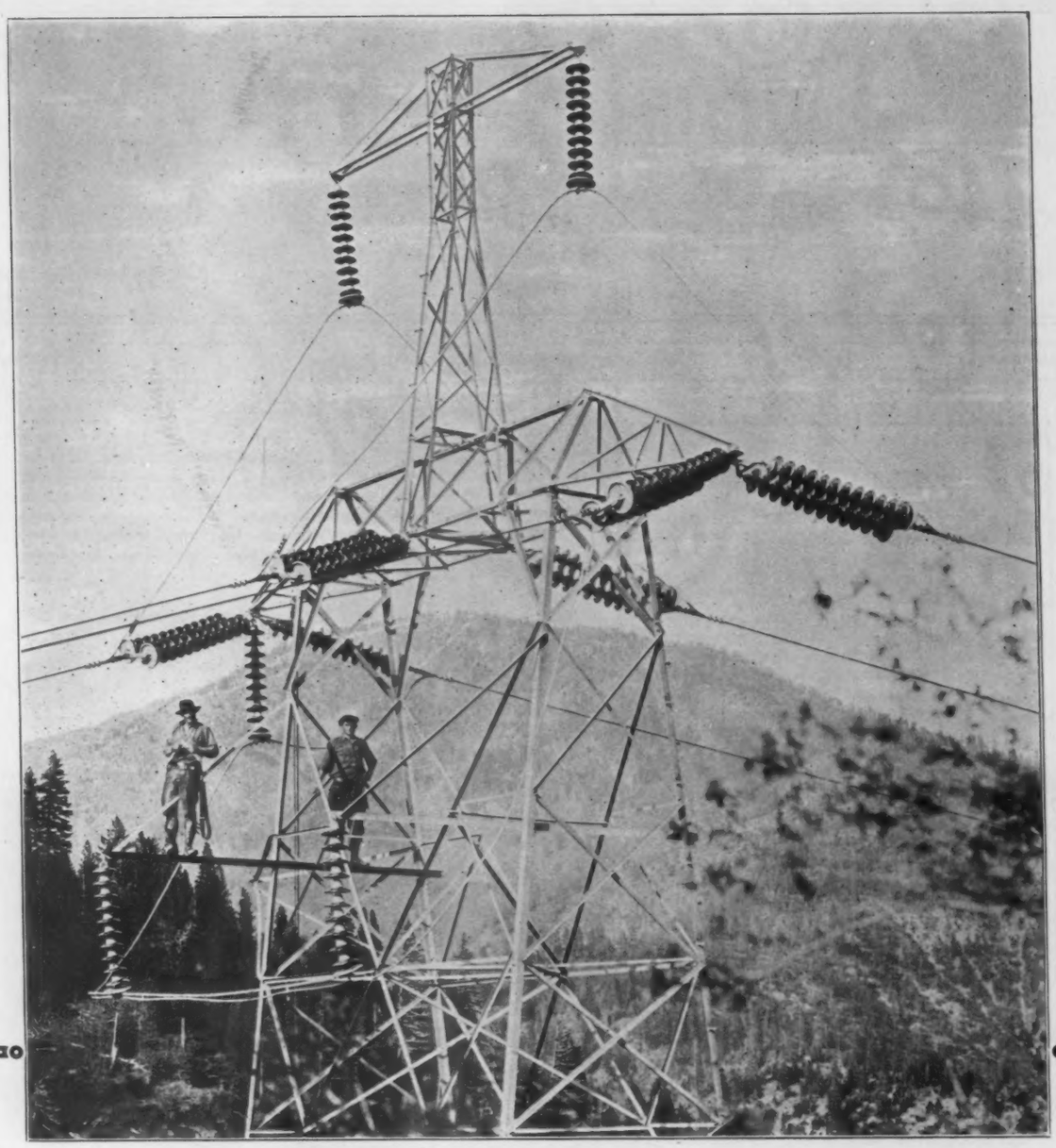

The Practical Overcoming of Inductive Interference

THE WEST, due to its pioneer work in the transmission of hydroelectric energy over longer distances and at higher voltages than have been attained elsewhere in the world, has had to solve the problem of inductive interference almost single handed. The work of the California Inductive Interference Committee, operating under the California Railroad Commission, has become a classic throughout the world in the matter of inductive interference. Here is shown the method of transposing the wires to overcome inductive interference on the world's highest voltage transmission system—that of the Great Western Power Company, which operates at 165,000 volts. An extension was placed on the tower to support the two wires crossing from one side to the other. The third wire was carried around the tower and under the wires to its proper place. Two additional brackets with suspension insulators were placed on the tower to hold this lower wire in place. This third jumper can be traced from the outside leg at the back of the tower, through the suspension string of insulators on the arm, across the two strings of insulators on the face of the tower and up to the nearest wire. A piece of ¾-in. pipe is used to support the conductor between the two strings of insulators where it crosses the face of the tower.

Journal of Electricity and Western Industry

A McGraw-Hill Publication

ROBERT SIBLEY, EDITOR

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The Inalienable Right of Men to Organize

NOT only is the right to organize an inalienable right of man, but our composite present day life is of such a nature as to make organization a factor of prime necessity. No organization can, however, long endure with only its immediate selfish interests held in view. That employer's association which does not in thought and in deed embrace the employe, and particularly hold the community interest ever in the fore front, must fail of highest attainment in usefulness and in the justification of its existence.

So it is also with the problem of organized labor. When crafts organize and restrict apprenticeship training so as to create an artificial demand for service from that craft, an uneconomic breaking of balance in the great law of supply and demand is brought about that rightfully creates resentment in the community served by that craft and greatly impairs public confidence in such institutions. In the same way any effort to lower efficiency of workers or to limit production of the worker below that of natural expression is directly opposed to the highest development of community interest, and must bring its reaction in public distrust, as it has done in the past in San Francisco, Seattle and other Pacific Coast cities.

These are two of the things that must receive careful and thoughtful attention on the part of organized labor, particularly in the West, if it is to continue as a factor in the economic development of this region.

The Pacific Coast Electrical Association

A MEETING is to be called of the Pacific Coast Geographic Division, N. E. L. A., to consider the changing of the name so that it will read "The Pacific Coast Electrical Association" with some statement following in which will be set forth the fact that this association is affiliated with the National Electric Light Association. It would seem that the time has come for such a change to be made. The Pacific Coast Division, N. E. L. A., has before it a tremendous year of possibilities, and all the power of a name that the public can readily understand and that will carry local influence combined with national prestige, will be needed.

It would seem also that as fast as possible the activities of the association and the eligibility to office and to membership should be so broadened as to embrace all branches of the industry upon an equal footing. It takes time, of course, to accomplish changes of this nature and it may be best to postpone some of these latter questions for future consideration. However, in the question of the name there should be no delay in its adoption at the earliest possible moment.

Western Port Facilities to Meet Trade Expansion

THE shifting of large fleets from the Atlantic trade with Europe to the Pacific coast trade, has called attention in a forcible manner to the flexibility of water transportation and the absolute necessity of Pacific ports being equipped with every device for the economical transference and warehousing of freight. Standardization of facilities and consequent uniformity in port charges will tend to develop a maximum benefit for the entire West.

The war blockade of the Atlantic brought several items of eastern commerce through the Indian route to the Pacific coast, an arrangement which has proved so satisfactory that it is being maintained. So important is this commerce that several of the European countries hitherto unrepresented on this coast are establishing consulates. Trade with the

Atlantic ports through the Panama Canal should be the means of securing for the West a larger part of the $20,000,000 per month export business which the United States is sending to Mexico. By the same means should we import deficiencies in our production to balance the exports, thereby establishing a permanent and growing commerce.

Imports must balance exports geographically as well as financially. It is for the best interests of the West that all Pacific Coast ports be brought to a condition of up-to-date efficiency. It is only by offering the attractions of prompt freight handling and reshipment conveniences that further commerce can be attracted.

An Unexploited Field in the Electrically Propelled Vehicle

CERTAIN short haul conditions not only in city districts but also in rural communities throughout the West, suggest the thought that the switchover from the gasoline engine as a prime mover to the storage battery is an event of the not far distant future. Inquiries are being made from many quarters concerning the cost of initial installation of vehicle batteries. This means but a short forerunner in time when the changeover of a complete fleet of gas engines to storage battery operation will take place. On another page of this issue A. Emory Wishon, general manager of the San Joaquin Light & Power Corporation, has forcefully set forth a plan of how interchangeable storage battery units may be set up. Briefly, his plan is that the power companies might well purchase large quantities of standard interchangeable storage battery equipment at cost price plus small profit to manufacturer, operate these interchangeable units insofar as the power system is concerned at off peak hours, and make possible uses of electrical power not now developed to any considerable degree. There is much that may be said in favor of this plan. The Prestolite system of interchangeable units for gas cars has long since become an outstanding success, and we believe that the problem of storage battery equipment in interchangeable units should receive careful consideration. The vast interconnected transmission lines of the West are available for service, and the hitherto unexploited field of transportation by electric energy awaits development.

Improving Sales Through Better Salesmanship

ONE of the greatest handicaps which the electrical retail merchant today must overcome in his endeavor to maintain his business as the principal retail outlet for electrical goods is the fact that as a rule the quality of salesmanship in retail stores, other than electrical, is on a higher plane than is the salesmanship in the store of the electrical merchant.

In this, as in other things, the electrical industry can well afford to follow the example of merchants in other lines where we find the proprietor or the manager of the store talking to the sales force about the goods, thereby educating them as to points in the goods that will appeal to the people who visit the store. The proper methods of approaching the customers, of handling their inquiries, of wrapping their packages and of returning their change are all covered in the educational work that is done with the sales force in the live successful retail store.

In the electrical industry we must also do these things if the retail electrical merchant is to dominate the retail distribution of electrical goods. The proprietors who attend the Association meetings must make it a point to carry back to their sales people the enthusiasm and knowledge there gained. They must encourage their sales people to read manufacturers' publications and trade journals with the idea that they will secure selling helps, and particularly information regarding the product which they are selling. It must be remembered that enthusiasm is one of the great assets of the successful salesman. There is nothing so important in creating sound enthusiasm as a thorough knowledge of the goods with the resultant confidence of the salesman in being able to present their qualities and usefulnesses. Therefore, Mr. Electrical Merchant, teach your sales people the essentials of salesmanship and include, in a large measure, information regarding the goods which you are selling.

Selling the Convenience Outlet Through the House Builder

CAMPAIGN movements of the West have done splendidly in their efforts to draw all branches of the industry together into a harmonious whole. Better merchandising problems have been tackled and solved. Advertising on a page basis with the cooperation of central stations and contractor-dealers has been forwarded. The convenience outlet and the electrical home campaigns have done much in spreading the electrical idea. The selling of power company securities and their purchase by members of the electrical industry has done wonders. And the national aspects through which national attention has been called to these outstanding accomplishments in the West, are not to be overlooked in the good will that has been directed toward the West from the East.

We ask ourselves, then, "What of the future?" Immediately ahead in the future must be the selling of the electrical idea completely to the public. This may be accomplished through the public school, through public addresses, through an appeal to industry as a whole. But above all in practical dollar and cent return, the getting of the home builder to work in the installation of more electrical convenience outlets is perhaps the best and most practical way of reaching every home with the electrical appeal. Already leaders of the industry in the West are quite awake to this possibility, and we find in growing communities such as Los Angeles that the thousands of Readi-cut houses that are being erected will in the future have the electrical convenience idea introduced in them, and the models from which these houses are built have in certain outstanding in-

stances been re-designed to carry the electrical idea. In this case, the builder himself was sold to the idea and needless to say all future efforts in the building of Readi-cut homes will be made with the electrical idea in view. This is only one forceful instance of what may be accomplished. The thousands of homes that are being built in the West can be made to carry this electrical message only by direct contact with the home builder himself. Here, then, is the big opportunity of the future. Get the home builder to work!

Open House at City Power Stations

THE great hydroelectric program of the West has called for some unusual settings on the opening day of each new power plant in recent months. Special trains have been run into the mountains and fleets of automobiles have been engaged to convey distinguished guests to the opening ceremonies, with the result that city editors have written editorials, country preachers have preached sermons on the little snowflake and its subsequent uses for man in the development of power. Too little attention, however, has been given to the nearby things in modern hydroelectric development. In the great metropolitan districts of the West are steam generating stations, substations for hydroelectric transmission, and other interesting equipment that should be opened more hospitably to the citizens and to the school children and students among the younger generation. More than one college man, for instance, recalls the first impression he got of the usefulness and efficiency of the modern hydroelectric system from the visit to the little power plant made in his young and impressionable days under the guidance of his professor. There is still too much mysticism about steam electric and hydroelectric generation. Here, then, is an opportunity, right at home, inexpensive, and accessible to thousands upon thousands of people. Why not try an open house day in local institutions of this nature?

Scientific Advance of Telephony in the West

SOME one has said that the vacuum tube is but a glorified lamp. Be this as it may, the vacuum tube has indeed become the practical method by which we control the path of electrons in order to assist in the transmission of human intelligence from one point of the earth's surface to the other, either by the well known telephone carrier wire or by radio. It is wonderful what is being accomplished in the West under this improved invention. In the period from 1910 to 1920 we find that the states of Washington, California, Oregon and a small portion of Nevada and Idaho grew from 4.2 millions to 5.6 millions of people, or an average growth of about 33%. The number of telephone calls, however, in this period of time in this same district, grew from 11 million to 39 million or three and a half times, representing a growth of about 350%. It is readily seen that the old method of transmitting telephone mesages by repeating by means of levers could never have handled this rapidly increasing load. As a consequence, it may be said that the substitution of the electron method whereby repetition is accomplished by assistance of the vacuum tube without distortion of the wave length and with a delicacy of energy emission to the point of about .01 of a watt, is what has made possible four or five conversations over the same wire at the same time without interference. It is difficult for the public to grasp this wonderful new advance of intelligence transmission, but to one who looks carefully and deeply into the technical features involved, the achievement ranks among the most inspiring of what may be practically accomplished under the highest type of research. It is possible to transfer intelligence by means of the human voice from Avalon, Catalina Island, by radio to San Pedro, thence by wire to San Francisco, thence to Philadelphia and on out to sea on the Atlantic Coast by radio, finally to be received by telephone aboard ship —one of the new wonders now being accomplished in the West. Without adequate communication communities will not thrive. The West is in full accord with this truism and everything possible is being done by those responsible to see that the West is in the van in the matter of intercommunication between its growing metropolitan centers. In this matter the Pacific Telephone & Telegraph Company is to be congratulated.

Catching Them Young To Promote Future Sales

FEW ENGINEERS graduate from college without having become sold for life on certain types of drawing instruments used in the drawing courses of their undergraduate years. Manufacturers of drawing instruments have long since recognized this characteristic, namely that we are all creatures of habit, and as a consequence are accustomed to place in the student's hands drawing instruments at greatly reduced prices. And the policy pays.

Now comes the suggestion that the electrical appliance utilized in the home be placed in the school, college and university. Here is a wonderful opportunity to put over the electrical idea. True, it may be that some months or even years may elapse before the industry as a whole will cash in on this educational program, but the idea is one that is certain of returns and should be given not only careful consideration, but every possible bit of endorsement and weight necessary to make the idea move into action.

Along with these installations there should be capable women to give instruction, or at least to assist university instructors in the practical lines of demonstration. What the younger generation is interested in gets into the home and to the older folk more quickly than one would think. Indeed, one does not always have to wait until the younger generation grow to be old people before an idea has travelled far beyond the generation in which it originated.

Western Comment on Current Events

Editorial Notes and Readers' Views on the Outstanding Aspects of Financing, Trade Promotion, Legislative and Associated Topics that have a Special Bearing on Western Business

Re-Export Zones Affect Western Ports

Proposed Congressional Tariff Measure Provides For Free Trade Areas at Pacific Ports. Single Port Provision Criticised

Western shipping interest at the present time centers upon the free port clause of the trade zone bill introduced into the Senate by Senator Jones of Washington and discussed elsewhere in this issue. Local foreign trade clubs and other bodies interested in trans-Pacific commerce have passed resolutions in its favor.

The provision that only one such free trade zone may be established on a single harbor unless more than one state is involved, however, is one which is detrimental to western interests and should be stricken out. The Puget Sound district, San Francisco harbor and other western points would thus be allowed only one such free zone, whereas New York and possibly Chesapeake Bay on the Atlantic could take advantage of two.

The establishment of such zones should be based upon the needs of commerce and should not be arbitrarily placed by state boundaries. On the other hand, the bill is the first step which has been taken toward the establishment of such free ports upon the Pacific Coast and with the exception of the minor objection noted, should receive the support of all westerners interested in the advancement of Pacific trade.

Engineers Report on Deschutes River

Board of Government Engineers Decides Relative Importance of Power and Irrigation Rights On Oregon Stream

Evolving the most effective plan for utilizing to a maximum both power and irrigation possibilities of the Deschutes River in Oregon, has been the purpose of a board of government engineers which recently submitted its report to the Federal Power Commission. The work of the board is of interest in this particular case and important as a precedent from which deductions may be made as to the policy of the Federal Power Commission. There are three western rivers on which power permits are pending and which are capable of being used for both power and irrigation—the Deschutes, the Columbia and the Colorado. The same board which reported on the Deschutes, together with the state engineers of Washington, Idaho and Montana has been named by the Power Commission as a board to make a comprehensive study of the Columbia River from Flathead Lake down. No similar arrangement has been announced, however, affecting the Colorado River. The Deschutes River board consists of D. C. Henny, consulting engineer, U. S. R. S., Col. J. B. Cavanaugh, engineer corps, U. S. A., and F. F. Henshaw, district engineer, U. S. G. S., all stationed at Portland, Oregon.

In its findings on the Deschutes River this board divides the stream into three sections; (1) that above Benham Falls, (2) that between Benham Falls and the mouth of Crooked River, and (3) that below the mouth of Crooked River. The board found that with full irrigation use in the upper and middle sections, 15 power sites could be developed in the lower section with an aggregate capacity of 471,600 hp. which might be increased by 38,500 hp. through storage on Crooked River. Nine of these sites, aggregating 362,300 hp. without storage could be developed, it was estimated, at less than $140 per hp. delivered at the mouth of the river. The board also found that an additional 156,000 hp. which could be developed in the middle section of the river, would be of far less value in a country of such abundant water power than the use of this water for irrigating the 110,000 to 140,000 acres of land now under cultivation there.

Los Angeles Traffic Problems Studied

Arcading System Suggested as Solution for Traffic Problems on Narrow Streets of Congested Business District

Los Angeles has for some time held an unenviable record from the standpoint of street accidents, a condition due to the narrow thoroughfares of its business district, combined with excessive motor traffic. In an effort to solve this difficulty by widening the streets in effect, without the tremendous expenditure involved in such an undertaking, City Engineer Osborne of that city has proposed that Los Angeles use the Temple Block to test the sidewalk arcade system. Under this plan, the curbs will be moved back to the building line and the sidewalks find shelter in long colonnades under the porch-like protection of the buildings themselves. This would double the advertising space available to the store owners and the romance of Old World streets and the charm of early mission architecture might find ready expression in such a plan. Certain it is, that unless Los Angeles is prepared to see its busi-

ness district shifted to other and more commodious streets, with all the waste and duplicated outlay which this involves, some remedy should be seriously considered at this time and the arcading system offers attractive possibilities.

University Aids in Industrial Survey

Unique Method of Conducting San Francisco Survey Made Possible Through Cooperation by Students of State University

A city wide survey of San Francisco's industries for the purpose of obtaining complete information regarding manufacturing activity upon which the community can base an intelligent industrial promotion campaign, is being made by 150 students of the economics classes of the University of California under the direction of the San Francisco Chamber of Commerce.

The survey will cover the consumption of all raw materials, the employment of labor, payroll figures for groups and for the whole manufacturing interest, the volume of business, and definite facts regarding the difficulties which the management in each industrial group seeks to overcome. It is expected that it will reveal many important business facts and will afford the basis for later intensive study of those lines of activity which are either inadequate or wholly unrepresented in San Francisco.

For the purposes of this survey the city has been districted and a student assigned to each district who will ascertain the names of all manufacturing firms. These will then be addressed by a letter from the Chamber of Commerce, followed by a personal call from a student who has been reassigned to some one industry throughout the city. It is expected that the work of obtaining and compiling the information will be complete by December 15th.

The students will be given college credit for their work and in addition have the advantage of the personal contact with business men and organizations as well as the practical experience in field research. In return the San Francisco Chamber of Commerce obtains the benefit of a survey which would have involved considerable expense to carry out and might not have been possible under other circumstances. The arrangement suggests the possibility of other beneficial cooperation between western universities and western industry.

Distribution of Securities Explained

Straightforward Stand for Careful Investigation and Truthful Advertising in the Distribution of Securities Taken by Western Bond House

The responsibility of a bond house for the protection of the public in the distribution of securities and the steps which are taken to ascertain the soundness of the issues they sponsor, was explained by Cyrus Pierce of Cyrus Pierce and Company in an address recently before the Rotary Club of Fresno, California. Mr. Pierce said in part:

> In the case of any corporation bond, before the bond house decides to purchase the bonds offered and to offer them to its customers with the moral responsibility of the house behind them, there will be employed chartered accountants, engineers, appraisers and attorneys. The true bond house regards its duty to its customers as paramount to every other consideration and holds its moral responsibility very high. Its salesmen are drilled that there are three rules that must be adhered to with the utmost rigidity; first, never under any circumstances misrepresent a security—tell the absolute truth about it, first, last and all the time; second, never allow a customer to purchase too large a proportion of any one issue; and, third, be sure that the particular investment is suited to the particular needs of the customer.

This statement by a prominent bond house is significant of the forward stand being taken by western financial interests who are handling the distribution of utility securities. This attitude is welcomed by all concerned with the welfare of that industry on this coast. It has happened in the past that a less high-minded attitude has led those selling utility securities to exaggerate on occasion concerning certain aspects of the companies represented. Such words of unmerited praise which cannot be substantiated upon later investigation are the most doubtful of benefits. The public service industry of the West has long appreciated the necessity for scrupulous honesty in every statement given out to the public.

Mr. Pierce in his connection with N. W. Halsey & Co. and with his present firm has played an important part in the distribution of utility securities, having handled $20,000,000 of the twenty-two million San Joaquin Light & Power Corporation bond issues as well as securities of many other of the western power systems.

Protest Against Tax Free Securities

Pacific Coast Gas Association Takes Action Urging Withdrawal of Tax Exemption Privileges From State and Local Securities

The injustice of allowing federal, state and local securities tax exemption privileges in competition with securities offered by public utilities and other industries was protested by the Pacific Coast Gas Association at their recent meeting held at Del Monte. The resolution as passed urged national action which would lead to corrective legislation.

The original purpose of such exemption was, of course, to obviate the supporting of one branch of the government at the expense of another, but in practice, it operates merely to permit governmental securities to be sold at lower rates of interest return. No part of the income derived from tax free securities is contributed toward the support of our public institutions or in payment of our national debt. As has already been pointed out in these columns, the question of governmental vs. private ownership of enterprise should be fought out on lines of their relative service to the people—and not as a left-handed method of revising the national or local tax system. Both types of enterprise should be placed on an even footing so that the public may understand that what they do not pay for in one way under government ownership, they pay for in another.

Letters to the Editor

Possibilities of the Electric Truck from the Power Company Standpoint

To the Editor:

Sir: Our experience with the electrical truck proves it to be slow, limited in possible distances, but of low maintenance cost, simple in operation, easy to start and stop, and having great possibilities for service work with the power companies if certain conditions are overcome. However my thought of the electrical vehicle possibilities never confined itself to the use of the vehicle by the central stations alone. At one time I could have sold twenty ice delivery trucks to one company if I could have secured the proper proposition.

If the electric truck is to come into its own within a reasonable time, in my opinion several objectionable features must be overcome, and with proper understanding and cooperation I believe they can be.

First: An electrical truck must not be limited in distances.

Second: In considering the purchase of a truck, even with a lower operating cost, the sale price must be practically comparable to the gas cars.

Third: At the present time the chassis of the truck, without battery, is approximately the price of a gas car. The question in my mind therefore resolves itself into the subject of battery cost.

Electrical vehicle batteries, like any other commodity, can be produced at a lower cost on a quantity basis than they can as manufactured at the present time in very limited numbers. If the battery companies can be shown that at one-third the profit they are now making on the battery they could sell five times the number of batteries they would readily agree, I believe, that an increased production at a lower price would be to their net profit.

In my opinion the questions of first cost to the consumer and limited distances can be overcome in the following manner:

Batteries can be manufactured, we will say, in units of 10 hp. with a 50-mile radius of use, and these units could be so constructed that they could be added to or taken from the truck in a couple of minutes, and then if the central stations could arrange to handle the charging and interchange of these units the limited distances of electrical trucking would be overcome.

Next, if the central station could arrange at its different sub-stations, or with different garages in each city, for charging batteries, and sell storage current at so much per kilowatt hour including the use of the battery, it would put storage energy on the same basis as gasoline to the consumer.

The power company's dream is 100% load factor daily and yearly, but it never comes true. There is always a certain part of the day when capacity is available, and, under normal conditions, when hydroelectric power is available—electric energy during that time could be sold at a wide margin of profit to the power company.

I am of the opinion that if the battery companies could see the possibilities of interchanging batteries similar to the way the old Prest-o-lite tanks were interchanged, and would sell to the central stations or dealers those batteries at factory cost plus a small margin of profit to begin with, and allow the power companies sufficient time on each battery to amortize that battery through the sale of current consumed by it, the trucking business could be developed in the next year or two to a point where it will not develop under the present methods in the next ten years. Where charging of the batteries could be done at a time of the day or year when the cost of energy was low the power company could as a good business proposition, afford to allow the full price of the current used in the batteries to go on the payment for the battery to the battery manufacturer. After the battery had been paid for it would then become the property of the power company, and that same current that is now idle could then be sold to the consumer for storage power at a net income to the power company.

Several years ago I made this line of argument to several of the battery companies and then found that it had been tried in the East with only fair success, but to me that does not prove the theory wrong or the scheme impossible.

If I were putting this scheme into effect on this system I would begin by trying to sell delivery trucks limited to in town work, and would set up one charging station to start the proposition, and would work toward the time when a continuous string of sub-stations, power company offices, garages, etc., from one end of the state to the other would be equipped for the charging and interchanging of batteries. It would be handled on much the same basis as the different railroads interchange cars today. This would ultimately allow electrical trucking from one end of the State of California to the other, with the right of interchange of batteries at all points.

While I have done nothing on this subject for the last year or so, I do not think it at all impossible at this time to convince some one battery company of the possibility of building an interchange battery, thereby increasing the flexibility of electrical trucking, and increasing their sales by selling this battery on time to the power companies that the power companies may earn the price of the battery through the current they sell through the battery.

If the battery companies will give terms to the central stations that will allow the central stations to handle the batteries on an interchange basis which will allow the consumer when considering the purchase of an electrical truck to be concerned only with the cost of the chassis, then you will see a real advance in the electrical vehicle game, and the sale of storage batteries for electrical vehicle purposes will be ten to one to what it is now.

I think the subject is well worth careful consideration.

Yours very truly

A. EMORY WISHON, General Manager
San Joaquin Light and Power Corporation
Fresno, California

Danger in Unrestrained Enthusiasm is the Warning of Western Jobber

To the Editor:

Sir: We are preaching to the retailer the necessity of better business methods, better locations, dressed up stores, and comprehensive window displays, which are all right and proper if there is a balance wheel somewhere. We should warn and advise the dealer, (a) of the danger of going too far in this expense, (b) of too many such stores in a given locality, (c) that as yet there is a limit to the immediate volume of business in sight, and (d) that high overheads are hard to reduce after you are once committed to them.

It should be the duty of managers and field men in this development movement to not only work up harmony and enthusiasm among the different branches of the industry, but to temper that enthusiasm. Too much enthusiasm

will blind us, too little will put us in the morgue. I never believed in revival services, and I sincerely trust that all our Pacific Coast plans will steer clear of the "Hip-hurrah, come in, think about it afterward" stuff.

We have a district in the Northwest that during the past several feverish years refused to be stampeded, but went along in the even tenor of its way. They and their business were regarded as dead. Today their volume is a little better than it was then, and is the brightest district in the Northwest. They pay their bills, have in their hip-pockets the profits they have made, and there have been no failures. I wish all the Northwest were in as good condition.

Finally, I would add that it is better to be tempered with a little pessimism than to be a blank fool optimist.

Results of our work in the Northwest will be slow, and that is as it should be, as no "cure-all" has yet been found, and we should not promise any. Our companies are firmly behind these various educational movements, but we refuse to get excited. We are playing for the long-drawn-out results.

FLOYD N. AVERILL, General Manager
Fobes Supply Company,
Portland, Oregon.

New Rule of the Road Necessitates Many Changes in Track and Equipment

To the Editor:

Sir: In accordance with the Highway Amendment, Act 1920, passed by the British Columbia Provincial Legislature, the rule of the road was changed from left to right hand operation, to become effective in the Western portion of the Province on December 31st, 1921. (The Eastern portion of the Province was changed over on July 1st, 1920).

This change involves the British Columbia Electric Railway Company in a $1,000,000 expenditure.

In order that the magnitude of the work involved in making this change-over may be understood I briefly give below particulars of what has to be performed and how we propose to do it.

Track: The following work will have to be performed in order to permit of cars and trains to operate right hand with the same efficiency, safety and convenience as they are at present being operated.

1. Take up and lay with new material 44 permanent and 12 temporary cross-overs.
2. Take up and lay with new material 7 permanent and 1 temporary Y layouts.
3. Change electric switches to adjoining tracks at 19 different points.
4. Change position of 8 derails.
5. Change spring switches.
6. Change elevation of certain portions of Interurban tracks to permit of safe operation.
7. Change location of Stations, Shelters, and Platforms at 13 points on double tracked Interurban lines.

The new track material and special work necessary to carry out the above is now on order but installation cannot be commenced until after the first of the year.

The estimated cost of track alterations is $416,902.67.

Overhead: The overhead changes in connection with this problem are by far the lightest item, and are estimated to cost $17,722.00. Like the track changes, very little under this heading can be accomplished until after the change-over becomes effective.

Rolling Stock: Rolling stock changes constitute the major work and expense involved in this change-over and I know of no precedent by which we might be guided in carrying out the same. There are 269 units to be rebuilt, comprising 20 different types of cars, each type requiring special alterations suitable only to that particular class of car. Temporary alterations are being carried out with the latest possible inconvenience to the travelling public and work is proceeding along the following lines:

Eight to ten cars at a time of a certain type are being brought into our Prior Street Shops, located in Vancouver, where temporary alterations to front and rear vestibule are made as well as installation of temporary steps on right hand side of cars. The right hand side openings are then boarded up and cars put back in service. When the change-over is actually about to take place the service on all lines will be considerably reduced for a period of from one to four days during which time the cars so released will be made suitable for right hand use by removing the boards from the right hand side openings, above referred to, and tying up securely the gates or doors, of which all our cars are equipped, on the left hand side. With this completed cars will then be ready for service. When all units have been so changed it will be necessary systematically again to put all the cars through the shops, two or three at a time, when **permanent** alterations will be made, such as installation of steps, and gates and doors, (to conform with Government regulations), installation of operating mechanism, as well as many other details.

I estimate it will take from 18 months to two years to put all the units through the shops and permanently equip them for right hand operation.

$498,773.00 is the estimated cost of changing over our rolling stock.

Conclusion: The above expenditures summarized amount to $933,397.67 not including indirect losses in revenue which the Company is bound to suffer from one cause or another for months following the change becoming effective. Further, it does not take care of increased accident costs which will undoubtedly be high.

Of the total figure quoted above the Provincial Government has agreed to contribute $350,000.00

W. G. MURRIN, Assistant General Manager.
British Columbia Electric Railway Company, Ltd.,
Vancouver, B. C.

Side Tracking the Danger of Price Cutting Through Creative Cooperation

To the Editor:

Sir: A problem of vital interest to the jobber and dealer today, is the return of pre-war conditions. Prices must soon stabilize and then will come stronger competition which is liable to cause an era of price cutting. The contractor should realize that the larger percentage of consumers are willing to pay a legitimate price for his installation and a contractor who once puts in his bid should know it is right and then stand by it. One of the greatest faults with some today is that they have the wrong impression that they must meet their competitor's figure. The most important factor should be to build up the customer's confidence by giving some service equal to the remuneration received, which will stabilize a business above competition. Meeting a competitor's figure is a sign post on the road to ruin.

There is a lack of advertising of electrical appliances in San Francisco and vicinity as compared with the southern part of the state and if we do not look to our laurels, electrical goods will soon be retailed here almost exclusively by the hardware and department stores. Some of the Los Angeles dealers can inform you how they, some three or four years ago, turned this trade back into its legitimate channels and are today selling practically 100% of the appliances used. The use of such appliances today in northern California is much less than it should be and an advertising campaign should bring gratifying results if properly handled. I feel quite sure that the power companies would be unanimous in their support of such a movement.

The electrical merchant cannot today make a great success by handling electrical appliances on a 30% margin. The answer lies in creative cooperation.

Wholesale Electric Company, A. R. FIERCE,
San Francisco Proprietor.

Builders of the West

WHEN a side-wheeler steamboat poked her nose on a sandbar in the lee of Point Firmin late in 1875 after a tiresome journey from San Francisco, Fred L. Baker, then a boy just short of ten years of age, was one of the passengers. With his parents, he had completed the long trip from Lansing, Michigan, to the land which was later vividly to bear the mark of his achievements. Today as president of the Los Angeles Steamship Company, he rides out of Los Angeles harbor on his own luxurious steamers.

FRED L. BAKER

Shipbuilder and owner of a fleet of swift seagoing traders, who envisages the Pacific Coast as the future center of world trade with Los Angeles as the ocean gateway for the vast backcountry of the great Southwest.

Varied has been his career in the shipping world. In 1917 he realized the importance of the shipping problem to the nation and with a group of associates prepared to build ships in a harbor that did not exist and in a shipyard that was all on paper. The Baker Iron Works, which he also heads, began fabricating the steel for the first vessel while an army of workers erected the plant. By the time the eighth ship left the ways even the 4,000 horsepower engines were made locally. The accomplishment might have been worthy of commendation even in an old established steel center, but to completely transform a big machine shop and to build a permanent shipyard covering seventy acres in a few months, smacks of Aladdin and his wonderful lamp. A few days ago, as president of the Los Angeles Shipbuilding and Dry Dock Company, Mr. Baker watched his wife christen the thirty-fifth hull launched for the United States Shipping Board.

As boys, Fred and his brother, Milo, worked as apprentices in the old City Foundry and Machine Shop, established by their father and an associate in 1877. Later the name was changed to the Baker Iron Works, known throughout the West for its advancement in mechanical lines. Much of the initiative for entering new fields has its beginning at one of the box lunches which are held at the plants and which are often attended by 4000 men. They result in an atmosphere of striving for still greater things, verifying Mr .Baker's conviction in placing responsibility on any man who proves that he can combine loyalty and efficient service in his work.

This idea of cooperation is not new in the western industrial world but it has been worked out to such a degree of perfection by Mr. Baker in his various plants, that the scheme has been taken as a model in many other industries. There is no set time for these box-lunch meetings but they are called when problems arise which demand the utmost cooperation between men and executives. The progress which has been made in some of the plants both in efficiency and output has been laid directly at the door of these informal meetings.

Nor has all of Mr. Baker's effort been devoted to business alone. From 1905 to 1908 he served as a member of the Board of Public Service Commissioners of Los Angeles, aiding in the securing of the 230-mile aqueduct system which furnishes the city with water. No single achievement of his life could better show his capacity for organization and his business principle of rendering service, than the Automobile Club of Southern California which he directed as president from its conception until last spring when its rolls numbered 60,000 members. Making a success of the auto club has been to him all the recreation and diversion that other men find on a country golf club links.

His present consuming ambition is directed toward the upbuilding of the shipping industry on the Pacific Coast, and Los Angeles Harbor in particular. He feels that the millions of dollars that he and his associates are investing in shipbuilding and in steamship lines will play an important part in carrying the commerce of the world to and from the Pacific coast.

So to Fred L. Baker, for his keen appreciation of the "men on the job," for his untiring effort for a bigger industrial west and his ambition to see the west of his dreams a reality in the near future, this issue of the Journal of Electricity and Western Industry is affectionately dedicated.

Building a World's Record Transmission Line in the West

Some of the Problems of Construction Which Have Been Overcome by Western Engineers in Building the Record 165,000-Volt, 240-Mile Transmission Line from the Caribou Plant to San Francisco

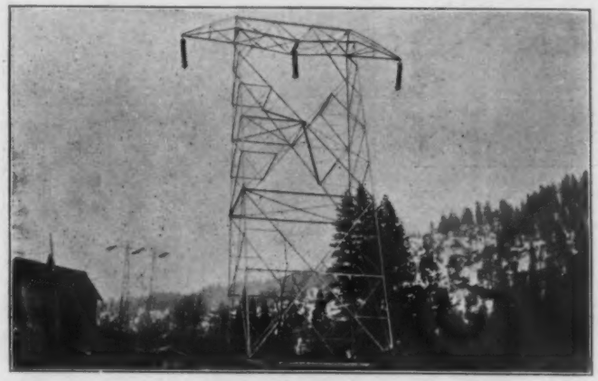
BY ROBERT SIBLEY
Editor Journal of Electricity and Western Industry

No. 1 shows the lower six insulators of a string of ten insulators together with the static shield and clamp in position.

IT was thirty years ago that the West was first able to boast of the longest transmission system in the world. The record of that day stood at 22½ miles transmission with a voltage of 10,000. Today even the spendid new record 165,000-volt Caribou - San Francisco line of the Great Western Power Company will within the next year be outdone by an even greater feat of constructive imagination in the installation of a 220,000-volt line from the Pit River country in Northern California to San Francisco, a distance of 240 miles. Experiments are already carrying the subject even to greater heights and we hear of the experimental line now in operation by the Southern California Edison Company at 235,000 volts over a distance of seven miles, and of the recent laboratory experiment in the East, playing with voltages of one million under commercial operating frequencies.

With increasing voltages, the problem of insulation has become more and more important and for a time, it was thought that the limit of possibilities was reached with 150,000 volts. Investigations carried on by Prof. Harris J. Ryan of Stanford University have shown, however, that it is possible to direct and modulate the critical strains set up in the atmosphere surrounding a conductor so as to distribute the load over a string of several insulators. The invention of a shield such as that shown in Fig. 1, and the use of ten, twelve or thirteen insulating discs in a row (Fig. 2) makes possible the new record 165,000-volt Great Western line whose construction the accompanying views portray.

No. 3 is the type of engine used for pulling the wire. A bull line (⅜ in. diameter plowshare steel rope of 600-ft. lengths with an eye splice each end) was used for pulling the wire through the towers. The line was made in 600-ft. lengths to make it lighter for handling and getting into difficult places. The lines were stretched out for a length of the wire (4,000 ft.) and connected with KB links. A 5-hp. gas engine, with a friction clutch and worm gear for a drive with 6-in. and 14-in. drum, was used to haul in the bull line and pull three conductors into place. As the three conductors came to the towers they were disconnected and passed through their correct position. In general practice it was found that the engine would pull about 2,500 lb. on the wire. The engine was located as near as possible to the transmission line, using snatch blocks to support the bull line where necessary between the last tower and the engine, and was used where the transmission line was near the railroad track or trails over which it could be moved. It was moved by its own power in some cases, by running a bull line out through a snatch block and in the other cases by using four horses to drag it, or again by push car when close to the railroad track.



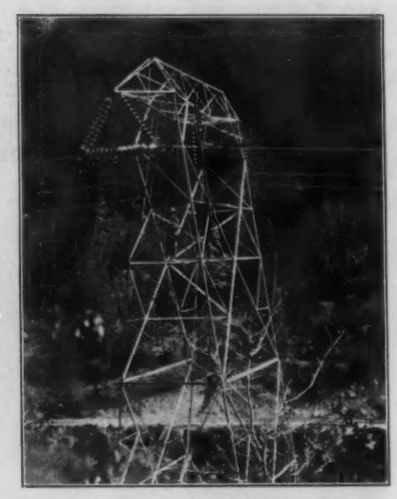
No. 2 is a portion of the completed line with a standard tower in the foreground and a dead end tower shown in the distance. Ten insulators per string were used on straight line construction and two strings of twelve each used at dead ends. Where V or double construction was employed, eleven insulators per string were used. The latter construction was employed over highways and where slight angles in the line were encountered.

It is difficult to visualize the constructive imagination and daring necessary to build such a line even with all the research data of the scientific world at the command of the engineer. Fig. 3 shows the ruggedness of the country through which the line must pass together with the mechanical devices necessary in drawing the snake-like strands of aluminum over the mountains, while Fig. 4 pictures a little offing alongside a transcontinental railroad where the giant reels are placed while the cables are drawn over the mountain peaks and across deep gorges by the engine shown in Fig. 3. Often through this rough country the wires must be pulled up steep slopes, at times seven hundred feet above the railroad right of way as shown in Fig. 5. Along with the stringing of the wires must go the installation of sectionalizing switches for the perfection of control in the operation of the transmission line.

EDITOR'S NOTE.—For the remarkable photographs shown in this article we are indebted to Walter Hays, superintendent of the construction gang of the Great Western Power Company, who took them as the work progressed.

No. 4. The reels were located as near as possible to the tower line, in some cases along the railroad track below. The wires were carried through snatch blocks up the mountain to keep them from rubbing on the ground and being cut by the rocks.

No. 5 shows the ruggedness of the country and heights to which some of the wires had to be pulled. In this picture the reels were located along the railroad track and pulled past the highest tower, which is located on Eagle Point, 700 ft. above the railroad right of way.



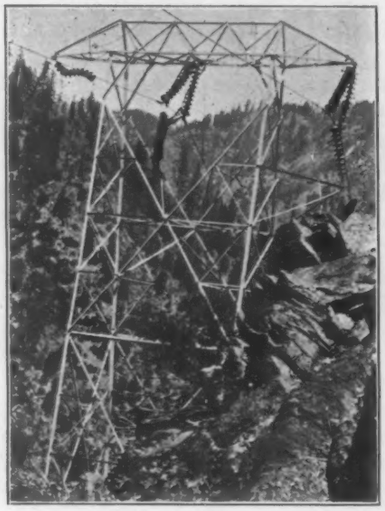
No. 6 is one leg of sectionalizing switch installed complete, showing the ladders which were used in its constructtion. These switches were installed by two linemen and two groundmen and later served in maintaining perfect control in the operation of a transmission line nearly 200 miles in length.

The conveying from place to place of the portable ladders used by the workmen in erecting the steel towers is a problem which calls forth the utmost ingenuity of the construction engineers, as pictured in Fig. 6. Intricate tricks must be performed in making a V-construction, or double installation of insulators for properly relieving the enormous weight of wire while the workman is making the preliminary attachments. This feat is illustrated in Fig. 7. The making of a dead end for abrupt turns requires careful handling of the wire while attaching it to the insulators. (Figs. 8, 9 and 10.)

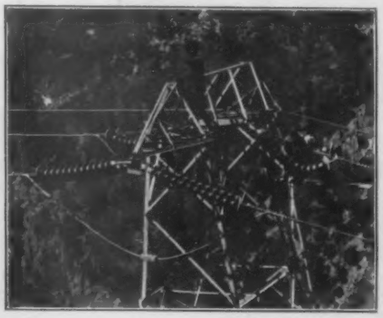
When the immense reels have exhausted their length of wire, splicing of the cables is necessary in such a fashion that the electrical conductivity may be preserved and the proper mechanical strength retained. This interesting mechanical operation is shown in Figs. 11 and 12. Often after the construction of the line is completed, accidents may occur which necessitate a careful examination of miles of cable. The daring feat of the workmen in riding along the wire is depicted in Fig. 13.

In the journey down from the mountain gorges to the metropolitan centers, great expanses of water call for spans of wire across distances never before equalled. Proper balancing of the tension on the insulators in such spans is a delicate procedure. Fig. 14 depicts the method of obtaining this balance for the wires over Carquinez Straits, the second longest span in the world.

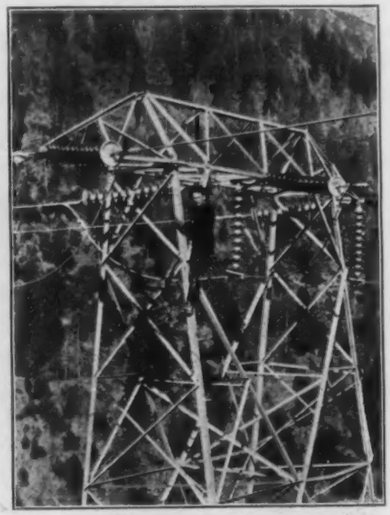
Inductive interference has been one of the problems which has been overcome in the construction



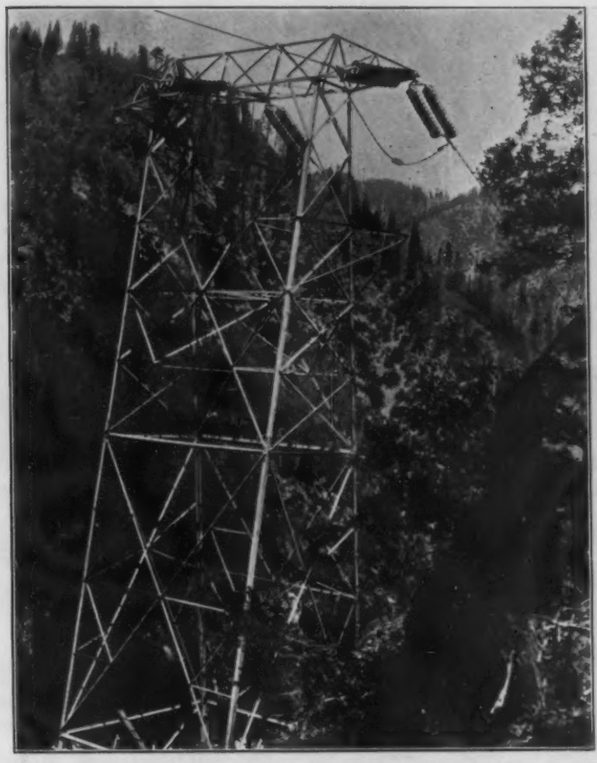
No. 7 is method of clamping a V or double construction of insulators. The workman stands on the tower and takes the weight off the insulators in which the conductor is hanging by use of a set of three-sheave 4-in. blocks and places the clamps in the proper location, hooking them to the insulators.



No. 8. In making dead ends, it was found better to string wire through, so that the wire stringing could go ahead, while a small crew followed to finish the dead ends. A lineman worked on either side of the tower on a ladder, fastening the yoke in its correct position by measuring out the length of a string of insulators. A turnbuckle was used to take enough slack out of the wire to allow the placing of the insulators between the yokes. One man could handle this by hanging first five units at one end, then seven at the other end, and hooking them together. The turnbuckle was then released and the jumper run between the two ends of the dead end. A plank is provided for the workmen to stand on. All this equipment is light so that it can be transported by hand. The man is here shown in the act of making the final connection of the string of insulators.



No. 9 is a full dead end and a half dead end. A half dead end or a single string of insulators for deadening was installed on short spans of 200 ft. or under. The vertical insulators shown in the picture were used on large angles to keep the jumpers directly under the point of suspension and give the maximum clearance.



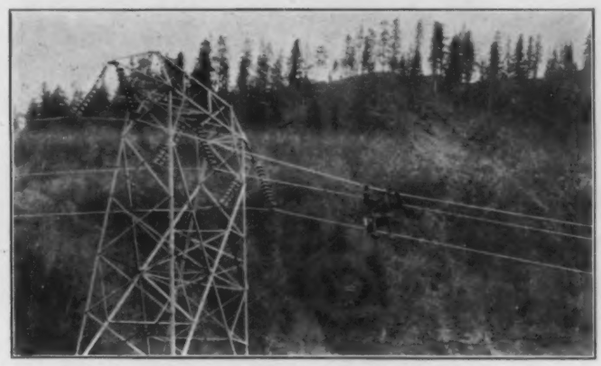
No. 10 shows the placing of the jumper between the two extreme ends of the dead end. On small angles a weight was placed on this jumper to keep the wind from blowing it too close to the tower, thus maintaining the minimum safe clearance. The picture also shows more clearly the type and manner of using the ladders.

No. 11 and No. 12. A splice is made by removing the aluminum strands from the steel core back 18½ in. from the end of the wire. The core from each end of the wire is then placed in a McIntyre sleeve and a clamp placed on each end for twisting purposes. Between these two clamps a piece of split pipe is wired to keep the sleeve from buckling as it is twisted. No. 11 shows clamps and pipe in place preparatory to twisting the splice. Note that one end of the splice is placed in a pipe driven into the ground so that one workman can hold it while two others twist. After five complete turns, clamps and split pipe are removed and the aluminum sleeves brought together over the McIntyre and screwed tight with monkey wrenches. This sleeve is then placed in a hundred-ton-per-square-inch hydraulic press, as shown in No. 12 and its ends pressed until a perfect mechanical joint is formed.

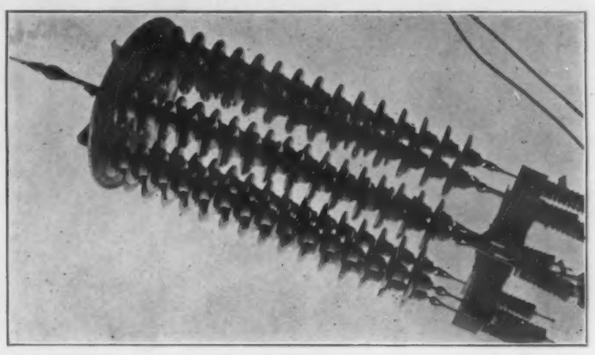
of long distance transmission lines in the West. The frontispiece illustrates the method of transposition which has been worked out by the Pacific Coast Inductive Interference Committee, to overcome this.

When we look at these accomplishments of the present we ask ourselves, "And what of the future?" In the years to come we see the industrial west not disfigured by unsightly smokestacks, nor our clear skies murky with the smoke and grime so unpleasantly associated with modern industry. Instead we see great transmission lines covering the western empire, harnessing the seventy per cent of the nation's water power which lies west of the Rocky Mountains and transmitting this energy to all centers of population to run our industries and to nurture our farms into more productive wealth. We see ever increasing voltages making possible the development of cheaper power and its conveyance over longer distances, and we see out on the western shores of this continent, the last new West,—an empire born of constructive imagination in the scientific use of the great laws of electricity.

Indeed we see in the commercial utilization of the forty million horsepower of the West, placed at a conservative productive value of twenty-five dollars per horsepower per year, a golden dream far beyond the halcyon days of forty-nine, a commercial value of one billion dollars annually in the production of raw power that will bring to life industries with an annual value exceeding even this remarkable figure by a hundred fold.



No. 13 shows the method of riding a cable with a carriage to examine a wire which had accidentally come in contact with a 44,000-volt line, near the line under construction.



No. 14 is a detail of deadending of wire at Carquinez Straits, the second longest span in the world. Springs were used to get equal strain on each string of insulators.

At the new plant of the Simons Brick Company two industrial trucks do all the work that 10 mules and 10 men would have been required to do, with less damage to the bricks and a saving of $15,000 a year.

Special Electric Trucking Opportunities in Western Cities

Western Conditions of Climate and Power Supply Make Possible the Ready Reduction of Transportation Costs and the Solution of Congestion Problems Through the Use of Electric Delivery Trucks

BY CARL K. CHAPIN

STREET transportation problems have become an absorbing topic in most of our western cities. The municipalities are striving to devise ways and means to control the situation; the merchant sees his delivery expense increasing by leaps and bounds; and the public, whether afoot or riding, suffers inconvenience or expense as an innocent bystander. This congestion suggests some phases of the delivery problem which can easily be remedied.

Rapid city growth establishes new centers of distribution and junctions in traffic where the streets, inadequate to carry the business, become scenes of traffic jams one after another all day long. The waste of time and fuel is appalling under such conditions. A few slow moving horse-drawn loads contribute more to these traffic jams than any other cause. What could be more uneconomical than hundreds of heavy-duty gasoline trucks with engines running, but trucks standing still, waiting for a jam to be broken. Fuel is going to waste and the vehicles are limited to a fraction of the mileage which

To negotiate the crowded streets without accident is always difficult but this is more dangerous with heavy loads like ice cream delivery. A new ice cream company finds electric trucks most satisfactory for its service and has ten vehicles on order at the present time.

With ten years to their credit and one renewal of Edison batteries who can guess the real life of these trucks? The Capitol Milling Company maintain and charge their own trucks and keep them like new. 100,000 miles and only out of service during painting time.

they might reasonably cover without such delays in transit. Motor trucks should be quick on the start and stop. They ought to be economical at all speeds within the limit prescribed by law, and the fuel expense should cease when the truck is standing still.

There was a time when the manufacturers of electric commercial vehicles sought the support of the power companies as if their very existence depended upon receiving such support. This is not the case any more. Hundreds and thousands of truck users know more than the electrical industry about the cost of delivery by gasoline or electric trucks. This is a result of keeping accurate cost

Part of a fleet of trucks recently installed by the Burr Creamery Company. Cleanliness and economy were given as the principal reasons Another creamery uses twenty-eight electric trucks in delivery work. This is only one example of the spreading use of electric trucks in western cities.

records in business where the delivery expense is an important factor. Only the large companies in the electrical field keep their transportation expense in such shape that it can be fully analyzed.

Special Opportunity in the West

It so happens that all the factors which are responsible for the success of the electric commercial vehicle in the eastern and central states, are present to an even greater extent, in the West. Rural roads and city streets are above the average to be found anywhere. The small rainfall general throughout the West, causes less trouble from mud and its tendency to increase the wear of bearings and other parts. If the isothermal lines of summer and winter are traced across the continent, it is apparent that the Pacific States have a winter climate similar to the South Atlantic and Gulf States, but the summers are to be compared with North New England States. The climate of the Pacific States, is very favorable to high efficiency in battery and motor equipment.

Advantages of the Electric Truck

The item of electric power represents about 20 per cent of the total expense in electric truck operation, where interest, depreciation, and a full accounting of all charges are made. The cheapest power supply in America is available in all western communities and there are good reasons for believing this will always be true. As an instance, the two 3½-ton trucks of a flour milling company are driven from 25 to 40 miles per day on a total power expense of $15 per month each. Each truck has gone more than 100,000 miles during its ten years' service with but one renewal of the battery.

Instead of requiring a driver with a thorough knowledge of his machine anyone can drive and be efficient in the handling of an electric truck. With good roads, even temperatures, and favorable labor conditions, it is natural for the few rotating parts of an electric truck to require but little upkeep or replacement expense when compared to the complicated engine of a gasoline machine which has over 200 reciprocating parts, all subject to wear.

Power companies have always given their attention to off-peak, high-yearly load factor business and particularly to the charging of fleets which are distributed over the systems, where they fit in to advantage with the general diversity factor.

Trucking Companies Enter the Field

It is interesting to see that recent additions to the Pacific Coast representatives of electric commercial vehicles, are men who were conceded to be experts in the gas truck industry with many years of experience. In their investigations while selling gas trucks, they were constantly confronted with lower costs of operation by electric trucks than they could show with gasoline machines. They did the obviously sensible thing. They quit the gas and

The first move toward a complete electrification of the city fleet of the Holsum Bakery was the recent purchase of twenty special Walker Electrics as shown. The bread industry has known for years that cleanliness, reliability, and economy were best possible with electric vehicles.

took up the electric business. As part of a Pacific Coast program they have installed in the city of Los Angeles during the last eight months, thirty-eight trucks each one adding from 8,000 to 10,000 kilowatt hours per year to the power lines.

There seems to be no limitation to the future of the Pacific Coast electric vehicle business. The eastern factories will undoubtedly come west with assembly plants or western factories will be built to handle this territory.

Preparing to Face Your Bank with a Clean Balance Sheet

Some of the Questions Which the Business Man Should Ask Himself Before Going to His Bank for Financial Aid Are Outlined in the Second of Two Articles on the Principles of Financing by a Western Banker

BY F. R. KERMAN
New Business Department, Bank of Italy, San Francisco

THE business of "house cleaning" as a preparation for asking financial aid is so important, that it is logically to be expected that every enterprise gives it first consideration. Unfortunately this is not true. Quite frequently the management gives no thought to the subject until the time is already ripe to launch financing plans,—and then it is too late. Even more universal is the entire neglect of adequate preparation and the seeming ignorance on the part of many otherwise capable men, that the adjustment of interior conditions is in fact a major part of the whole undertaking.

Building a New Enterprise for the Future

Far-sighted men who launch an enterprise of any dimensions, always build for the future. They look ahead not to the next year, or to the year after that, but five years, ten years,—or perhaps a generation. They weave into their organization the basis for financing plans of a later day. They consider the character of those individuals who are to be identified with them, and the far reaching trade policies which are to be pursued. Great care is exercised in selecting a location for their plant, keeping always in mind the proximity to raw materials, suitable fuel, markets, labor supply, and transportation. Nothing of a questionable nature is permitted to shadow any of their dealings, and while it may be said that one eye is always kept on the balance sheet, certainly the other is glued to the Ten Commandments.

Wise promoters, in their organization process, always cultivate the friendly offices of a strong Bank. They want to follow the "straight and narrow path," but they feel better repaid for their efforts if a prominent financial institution is close enough to see and appreciate the exhibition. It is not out of place to say that many small industrial plants have succeeded in doing this,—largely because they scrupulously maintained comfortable bank balances during their formative period.

Financial Aid for a Going Concern

Now consider the case of a going concern. The time is approaching, the management feels, when new financing will have to be undertaken. It matters not whether the need be for additional capital, or temporary assistance—at present it is enough to know that the house must be put in order. What is to be done?

First of all, the keen thinking business manager will look about for a reason to which he may publicly assign the necessity for additional financing. It is a matter of record that most small companies have been especially successful in securing added funds when they were able to announce that some well-known individual was to join the organization; that a new and desirable trade connection had been secured; that an improved process was being installed; or that territory as yet undeveloped had been opened up. This, however, is something that should be reserved for publication at the so-called psychological moment. Meanwhile, the renovation must be in process of fulfillment.

If the business has not been incorporated, this may properly be considered, and almost any well informed accountant or attorney can handle the situation. But this does not affect an escape from the ultimate and most essential duty of the entire preparation,—the adjustment of the concern's particular family skeleton—the financial statement or balance sheet. For in that single document is written the success or failure of the program. It tells the story of wastefulness and inefficiency; of ignorance and debt. For, after all, whatever plan may appear best suited to public requirements, the ability of the management to obtain financial cooperation becomes a question of the strength of its own condition.

Estimating Your Own Credit Value

With this in mind, every forward-looking proprietor or manager of a small plant will do well to examine his affairs through the spectacles of a credit man. He must ask himself a series of questions, and find the right answer to each one. Among those on the list that stand out prominently are: Do we use acceptances in our business, and would they be beneficial? Are we employing the customary credit terms in both our buying and selling? What is the condition of our cash on hand? Is it adequate? Do we use the right method of determining depreciation? Do we owe too much or not enough for a business of this character, and at this time of year? What is our trade reputation? How about our purchasing? Do we buy enough to get quantity prices, or are we buying too heavily? Can we collect the accounts now payable? Have we figured a proper ratio of credit losses? Is our manufacturing method efficient? And so on. For these are but a few of the questions that the financial statement calls up.

But in this detailed catechism lies the root of successful financing and, hard as it may be to buckle down and work through, it is infinitely easier than to acknowledge ultimate failure. Moreover, the management that unflinchingly goes into this business of house cleaning, as a preparation for future financing, finds that the more thorough-going a job it makes of it, the easier it is to move back in after things are clean.

Many Possibilities Shown in Western Manufacturer's Agency

Effective Work Done by One Manufacturer's Agent in Spreading the Electrical Idea by Developing the Possibilities Open to a Factory Representative is Pointed out by a Competitor

BY MAX LOEWENTHAL
President, Globe Commercial Company, San Francisco

TO the various unsolved and presumably "unsolvable" problems of the ages, such as perpetual motion, and the transmutation of metals, modern economic conditions have contributed additional mysteries one of which has persistently defied analysis and classification. We refer particularly to the Manufacturer's Agent, a much-maligned and ill-understood member of our modern business

Although the Western Agencies, Inc., sells only to dealers and jobbers, by the use of attractive window displays in a district adjacent to the retail shopping section, they have helped sell the electrical idea to the public.

organization. He has been maligned, no doubt, not only because he and his status have been misunderstood, but, largely because, as in all new fields of endeavor, many neophites have entered without a knowledge of its manifold requirements and poorly equipped by reason of lack of business experience and financial stability, to cope with a complex situation and assume the requisite and unescapable responsibilities.

Unfit Have Been Largely Eliminated

Fortunately the situation has been clarified and the duties of a business agent have been more clearly defined through a process of evolution. The entrance into the field by firms and individuals whose business experience, financial responsibility and understanding of business ethics entitle them to the confidence of the trade and the public has also elevated the Manufacturer's Agency to a "profession" requiring well-defined and high-class qualifications.

Primarily the Manufacturer's Agent must have a knowledge of salesmanship in its broadest sense, for he assumes the duties of local salesmanager or salesman for one or more factories, generally located at a considerable distance from his field of operations.

He must have a comprehensive knowledge of business procedure, for the factory's interests and the execution of its sales policy are to a large extent placed in his hands. This includes, of course, not only broad vision as to the selection and handling of the trade channels through which the merchandise in question had best be distributed, but also a sense of appreciation of the financial stability of such channels with special reference as to proper discrimination in the granting of credits, whether the agent does his own billing or whether this is done by the factories who depend largely upon the Manufacturer's Agent's judgment in this respect.

Again, the Manufacturer's Agent should have sufficient finances to enable him to conduct his business for the best interests of the factories he represents, such service including the proper display of samples, the adequate storage and handling of merchandise, employment of sales and office help, carrying of customers' accounts (in some cases), making occasional trips to the factories, etc.

Manufacturer's Agent is Important Link

The demand for and the ability to measure up to all of these qualifications has already eliminated many irresponsible individuals from this field, which is being recognized as an all-important link in the chain of modern merchandising by manufacturers, who cannot in most cases adequately cover the enormous territory over which they want to distribute their merchandise. Jobbers also welcome a local and well-informed factory representative, and the dealer can secure through this direct source accurate and authentic information regarding the factory's product and be assured of service, in the case of

A full line of ranges, with hot water attachments and fixtures are connected in the handsome display room. Dealers and jobbers are encouraged to take advantage of this and bring their customers for a demonstration.

appliances, which he in turn can transmit, as a selling argument, to his prospective customers.

As a factor in this process of elimination, above referred to, a number of firms and individuals have appeared who are maintaining the high standard which has earned for this new branch of our modern, commercial development an enviable reputation and a lasting place in the complex system of modern merchandising.

The greatest need for the establishment of a factory agency lies within territory distantly removed from the factory itself, at which distance it

Easy chairs adjacent to tables upon which manufacturers' literature is displayed make the office an attractive place for jobber and dealer to bring their customers. A full line of appliances is also on display.

is difficult and expensive to direct a home sales force and where local trade conditions must be studied and met by a force of men always on the ground and thoroughly conversant with ever-varying situations. The further away from the factory or source such an agency may be, the larger will be the territory alloted in most cases, and the greater, therefore, will be the responsibility resting upon the shoulders of those to whom the factory's interests may be entrusted.

It is most natural then that we should find the Pacific Coast an inviting, though not always fertile, field for the creation and elimination of "M. A.'s" of innumerable varities.

And, it is, therefore, with considerable gratification that the writer, backing his judgment by many years of experience along these lines and trying to prove himself worthy of having the "M. A." degree conferred on himself, can find among the large number of establishments on the Pacific Coast, one, which, in every particular measures up to the qualifications referred to in this article and which has won for itself not only the confidence of the factories which it represents, but also the respect and good will of the trade within the territory in which it operates.

Western Firm is Shining Example

This firm, "Western Agencies, Incorporated," has its principal place of business in San Francisco, with branches at Los Angeles and Seattle. The new San Francisco headquarters, some views of which are presented herewith, represent what may be said to be the last word in equipment of a Manufacturer's Agency from a view point of convenience and elaborateness of display and efficiency of storing and shipping of merchandise. Contrary to custom of operating from a suite of offices, the premises are located on the street level in the most travelled wholesale section of the city, only one block from the retail shopping district, making it accessible to the jobber, dealer and customer who might wish to see a full line of the appliances on display or in operation.

With this idea in mind, the goods are not only artistically displayed in the spacious show window, 20 feet in width and 10 feet in depth, but within elaborate mahogany show cases and on tables a sample of each article is put in plain view, in the handsomely appointed display room. In another room all lighting fixtures are connected so that each fixture can be lighted separately. In the same room a range and other appliances can be shown in actual operation.

Novel Features Have Proven Great Success

That this inter-linking of "service" is appreciated by the trade is evidenced by the number of prospective customers who come to the place upon the solicitation of dealers and power companies who realize that a factory demonstration greatly augments the buyer's confidence. This has resulted in a large number of leads being given to the dealers. To complete this chain of cooperation stretching from factory to consumer, a complete service department has been equipped, with a competent mechanic in charge, and full sets of parts of all appliances and fixtures are carried in stock.

The entire comprehensive organization is working under the direction of N. Abrams, known throughout the the Pacific Coast and among the eastern manufacturing centers, as a capable and energetic sales producer and executive. He is ably supported by J. W. Thompson, sales-manager, who has for many years been prominently identified with nationally-known establishments.

The writer trusts that the description of the premises of Western Agencies, Inc., and the nature of the service being rendered, may contribute a formidable alibi in behalf of the Manufacturer's Agent, if the need for the same ever existed.

Experimental Radio Market News Service

A daily market report prepared by the U. S. Bureau of Markets is now being sent by radio from the laboratory of the Bureau of Standards. This report is known as the Daily Radio Marketgram. It is about 500 words long and gives prices and market conditions of fruit and vegetables, grain, dairy products, hay, feed, and seeds, livestock and meats of the principal markets in the nation.

This service was started as an experiment to determine whether the distribution of market news by radio could be conducted in a satisfactory manner. It is probable that this experimental service will be extended by the transmission of market news by radio from several other stations, including some in the mid-western states.

Well Equipped Ports Handle Pacific Coast Commerce

One of a Pictorial Series Featuring Interesting Applications of Electric Service, Advances in Home, Industrial and Power Construction and Noteworthy Developments in Western Progress

The Pacific trade from all of Canada has its outlet through the port of Vancouver, B. C., which is one of the foremost shipping centers of the Pacific Coast. The Dominion has erected a grain elevator here and important harbor improvements are planned.

Three quarters of a billion dollars in foreign and domestic commerce passes through the port of Seattle every year. To handle this tremendous trade, Seattle has outfitted its municipal piers and warehouses with extensive electrical equipment of all kinds.

San Francisco has one of the largest landlocked harbors in the world, with forty or more piers, over which forty per cent of the foreign commerce of the Pacific Coast is handled. The larger piers devoted to foreign trade are equipped with the most modern electric labor saving devices for handling freight expeditiously and flexible trains of electric trucks care for much of the water front transportation.

Portland records how the most rapidly growing foreign commerce of any port on the Pacific Coast, full fifty per cent of the exports representing local products. An electrically operated grain elevator and other electrical conveniences greatly facilitate shipment.

An electrically operated cotton compress and other mechanical devices help to handle the great volume of Southwestern products which pass through Los Angeles, where some of the most active harbor improvement on the Pacific Coast is being carried on.

Study Course

A University Accounting Course for the Contractor-Dealer and the Business Men in the Small Industrial Plant

BY PAUL B. KELLY

XV—THE PRACTICAL OPERATION OF THE STANDARD ACCOUNTING SYSTEM—CALCULATION OF OVERHEAD PERCENTAGES AND TURNOVER RATES

The monthly Summary of Operations and the monthly Balance Sheet produced by the Standard Accounting System yield a very considerable part of the information needed by the contractor-dealer. The use and significance of the figures that appear in these two statements do not need further elaboration. In this regard, it may be mentioned that the introductory article of this course contains many suggestions as to the way in which the contractor-dealer may use the facts thus made manifest.

However, there are other facts that the contractor-dealer must know that can be secured only by a little further calculation. The monthly Summary of Operations is a statement for the business considered as a whole. But the contractor-dealer does two distinctly different types of business—merchandising and construction work. Each of these activities requires different kinds of expenditures and entails different rates of overhead. In any contractor-dealer establishment, the portion of the profit derived from each may vary greatly. One activity may be carried on at a profit, while the other is conducted at a loss.

The picture of the business as a whole which the monthly Summary of Operations presents is very useful in checking the leaks, for income tax returns, and for other purposes which necessitate the consideration of the business as a unit. But in order to find out what each class of business does and to make sure that it stands on its own feet, a statement is needed which will show for each class of business the amount of sales, the cost of sales, the gross profit, the overhead expense, and the net profit. In short, the electrical contractor-dealer needs two monthly summaries of operation instead of one.

The most convenient and economical way of securing these two summaries of operations is to produce one combined statement of the kind that the Standard Accounting System provides and then to "split" it in two. The process is very simple. The chief requisite is a good inside knowledge of the particular business for which the split is to be made.

"Splitting" the Monthly Summary of Operations

Before reading the description of how this split is made, you should examine the example shown in the first of the accompanying illustrations of how this was done for the Acme Electric Co.

A columnar sheet provided with at least three pairs of columns is most convenient. Note the naming and use of the columns illustrated.

In the first pair of columns entitled "Combined Statements Produced by Books," the figures shown by the regular Monthly Summary of Operations are entered. The various items of income and expense should be arranged in the manner illustrated so as to show the gross profit, the total overhead expense, and the net profit.

Not all the items shown in the Monthly Summary of Operations are included when making the split. Items which refer to the expense of getting money or income from others for the use of money are omitted. These items are known as "financial" income and expenses. They vary in amount from time to time and from business to business. They are not included when the split is made because they would spoil the resulting statements for comparative purposes. The item omitted are: Cash Discount Allowed, Cash Discount Earned, Interest Paid, and Interest Received.

The second pair of columns is used for the entry of such portion of the various items of income and expense as is attributable to merchandising operations. The third pair of columns is used for the entry of the share of income and expense items assignable to construction operations. Of course, the term "merchandising operations" is synonomous with "store sales;" "construction operations" is equivalent to "construction sales."

In determining the basis upon which the numerous items shall be apportioned to the two classes of operations, no general rules can be laid down. Some items cause no trouble as to distribution because the exact amount due to each kind of operations is known; other items are easily disposed of because they are incurred for the sole benefit of one class. But many expense items are incurred for the joint benefit of both classes. In apportioning these items, a knowledge of the particular circumstances in each business and plain common sense and judgment are the only guides. The apportionment must be as equitable as practicable, all the attending circumstances being considered. A comment on the distribution of the items in the analysis illustrated will make the procedure clearer. Remember, however, that the exact basis of distribution used is equitable, perhaps, for this concern alone.

Editor's Note.—This is the last of the series of articles by Mr. Kelly on the use of the Standard Accounting System. A new study course will begin with the next issue.

The distribution of the first two items is easily made. The Sales Recapitulation Sheet classifies sales and the cost of sales into these two classes. By turning to the Sales Recapitulation Sheets for the month, the part of the "Sales Billed" figure which is store sales and the part which is construction sales may be found. The cost of each class of sales may be obtained in the same way.

Because it was designed for the sole benefit of the merchandising end of the business, the entire amount of the advertising was apportioned to merchandising operations.

All of the following items were assigned to construction operations because they were necessitated exclusively by this kind of business:

Auto Expense
Allowance for Depreciation on Autos
Allowance for Depreciation on Tools

Each class of operations was allotted one half of the following items because it was considered that they were necessitated by one as much as the other:

Stationery and Office Supplies
Telegraph and Telephone
Taxes
Insurance
Association Expense
Warehouse Upkeep
Allowance for Loss on Accounts Receivable
Allowance for Depreciation on Merchandise

Because it was considered that this was approximately the ratio in which the benefits were received by each, the following items were distributed two-thirds to Merchandising Operations and one-third to Construction Operations:

Rent
Light, Heat, and Power
Postage
Other General Expenses
Allowance for Depreciation on Furniture and Office Appliances

A knowledge of the purpose of the expenditure caused the full amount of "Freight, Express, and Carting Unabsorbed" to be assigned to construction operations.

The "Salaries" item was distributed upon the basis of the time spent by the clerks and the management for the benefit of each class of operations.

After every item in the first pair of columns has been distributed to the second and third pairs of columns, the gross profit, the overhead expense, and the net profit on each class of operations can be easily figured. The illustration given is ample explanation of this point.

Condensed Summary of Operations

A "condensed" summary of operations is one that is extremely concise and is designed to eliminate detail. It is arranged as follows:

Sales Billed
Less: Cost of Sales Billed
Gross Profit
Less: Overhead Expenses
Net Profit

ANALYSIS OF THE MONTHLY SUMMARY OF OPERATIONS INTO SEPARATE SUMMARIES OF MERCHANDISING AND CONSTRUCTION OPERATIONS

ACME ELECTRIC CO.
JANUARY 1920.

ITEM	COMBINED STATEMENT PRODUCED BY BOOKS	SUMMARY OF MERCHANDISING OPERATIONS	SUMMARY OF CONSTRUCTION OPERATIONS
Sales Billed	7075 05	2528 28	4546 77
Less Cost of Sales Billed	5192 46	1861 06	3331 40
Gross Profit	1882 59	667 22	1215 37
OVERHEAD EXPENSE			
Freight Express & Carting Unabsorbed	4 96		4 96
Salaries	814 80	116 52	698 28
Rent	52 50	35 00	17 50
Light, Heat, Power	33 35	22 23	11 12
Stationery & Office Supplie	12 38	6 19	6 19
Telegraph & Telephone	14 15	7 08	7 07
Postage	9 15	6 10	3 05
Advertising	69 01	65 04	
Taxes	25 42	12 71	12 71
Insurance	38 13	19 07	19 06
Association Expenses	40 00	20 00	20 00
Warehouse Upkeep	25 00	12 50	12 50
Auto Expense	81 96		81 96
Other General Expense	28 48	18 98	9 50
Allowance for Loss on Accts Rec	16 00	8 00	8 00
Allowance for Depr'n on Furn & Off App	9 00	6 00	3 00
Allowance for Depr'n on Autos	60 00		60 00
Allowance for Depr'n on Tools	7 50		7 50
Allowance for Depr'n on Mdse	41 50	20 75	20 75
TOTAL OVERHEAD EXPENSE	1378 82	376 17	1002 65
Net Profit	503 77	291 05	212 72

Splitting the monthly summary of operations, provided for by the Standard Accounting System enables the contractor-dealer to see where each department of his business stands

ACME ELECTRIC CO.
YEAR 1920

CONDENSED SUMMARY OF OPERATIONS

ITEM	JANUARY STORE	JANUARY CONSTRUCTION	FEBRUARY STORE	FEBRUARY CONSTRUCTION	MARCH STORE	MARCH CONSTRUCTION
Sales Billed	2528 28	4546 77	1726 17	3550 50	1517 92	4111 43
Less: Cost of Sales Billed	1861 06	3331 40	1385 41	2730 16	1067 94	2880 71
Gross Profit	667 22	1215 37	340 76	820 34	449 98	1230 72
Less: Overhead Expenses	376 17	1002 65	401 10	1120 80	306 60	976 58
Net Profit	291 05	212 72		300 54	143 38	254 14

DISTRIBUTION OF EACH DOLLAR RECEIVED FROM SALES

ITEM	STORE	CONSTRUCTION	STORE	CONSTRUCTION	STORE	CONSTRUCTION
Cost of Sales Billed	7362	7327	7980	7946	7036	7008
Overhead	1487	2205	2310	1884	2022	2374
Net Profit	1151	0468		0670	0942	0618
Total	$ 1.0000	$ 1.0000	$ 1.0000	$ 1.0000	$ 1.0000	$ 1.0000

RATES OF TURNOVER

ITEM	MDSE	ACCTS REC	MDSE	ACCTS REC	MDSE	ACCTS REC
Balance on first of the month	11430 38	4067948	10157 25	9422 12	9295 98	8117 96
Amount credited during the month	12697 56	7566 69	7685 34	8184 71	2505 80	5477 78
Monthly rate of turnover	38.3 %	70.9 %	46.1 %	90.1 %	27.0 %	78.8 %

Suggestion are given in the text for making a condensed summary of operations, as well as calculating the distribution of each dollar received and the rate of turnover from the various departments.

A condensed summary of operations should be made each month for each class of operations. This entails no additional work as the necessary figures are available when once the Summary of Operations has been split in the manner just described. It only remains to list the figures on a columnar sheet each month for comparative purposes. A very convenient way of doing this is shown in the accompanying illustration.

Notice in the table above that each month is assigned a pair of columns. In one of the columns the condensed summary of "store" or "merchandising" operations is entered; in the other is placed the condensed summary of construction operations. Check the figures in the "January" column to see how they are transferred from the summaries resulting from the split of the Monthly Summary of Operations.

Distribution of Each Dollar Received from Sales

For the purpose of billing, or fixing prices, or making bids the figures shown in the condensed

summaries of operations should be reduced to a percentage basis. Each dollar received from sales must cover three items. These items are:

1. Cost of Sales Billed
2. Overhead Expense
3. Net Profit (or, Net Loss)

By showing how many cents of each dollar of sales represent cost, how many cents represent overhead expense, and how many profit, the information shown in the condensed summaries is converted to its most usable form. The figures shown in the second table of the foregoing illustration carry the same meaning as those shown in the first. In the latter, however, the figures are arranged in a slightly different order and are reduced to the basis of one dollar.

In order to obtain figures showing the distribution of each dollar received from sales, the rule followed is:

"Divide each amount shown in the condensed summary of operations by the amount of sales billed shown by that statement."

The procedure can be illustrated by showing how the distribution of each dollar received from store sales during January was calculated. Note how the rule operates.

ITEM	Figures shown in condensed summary of operation.	Divide figure in first column by total of sales billed	Distribution of each dollar rec'd from store sales in January
Cost of Sales Billed....	1861.06	÷ 2528.28	$ .7362
Overhead Expenses....	376.17	÷ 2528.28	.1487
Net Profit	291.05	÷ 2528.28	.1151
Total	2528.28	÷ 2528.28	$1.0000

In calculating the distribution of the dollar, carry out the division to the one-hundredth of a cent. The distribution of each dollar received from sales of each kind should be calculated each month. For comparative purposes, the figures should be recorded on the same columnar sheet as the Condensed Summary of Operations.

Rates of Turnover

Rates of turnover are indices of how hard the business man is making his money work. Every asset has a rate of turnover. The electrical contractor-dealer, however, is interested chiefly in the rate of turnover in only two assets—Merchandise and Accounts Receivable. The introductory article contained a discussion of the nature of turnover rates and their significance. You are advised to review it.

Rate of Turnover in Merchandise.—The monthly turnover rate for merchandise should be calculated according to the following rule:

"Divide the amount credited to the Merchandise Account during the month by the balance of this account at the beginning of the month."

The balance of the merchandise account at the beginning of the month and the amount credited to this account during the month may be obtained by referring to the Merchandise Account in the general ledger.

The rate of turnover in merchandise during January, 1920 for the Acme Electric Co. was calculated as follows:

$$\frac{\text{Amount credited to Mdse. Acct. during January}}{\text{Balance of Mdse. Acct. on January 1st}} = \frac{4,264.56}{11,130.38} = 38.3\%$$

Rate of Turnover in Accounts Receivable.—The monthly rate of turnover in Accounts Receivable may be found by the following rule:

"Divide the amount credited during the month to the Accounts Receivable Account by the balance of this account at the beginning of the month."

The data needed to calculate the rate of turnover for Accounts Receivable may be secured from this account in the general ledger. The calculation of the rate of turnover in this asset during January 1920 for the Acme Electric Co., was as follows:

$$\frac{\text{Am-t credited to the Accts. Rec. Acct. during January}}{\text{Balance of Accts. Rec. Acct. on January 1st}} = \frac{7,566.69}{10,679.49} = 70.9\%$$

The data relative to the monthly rates of turnover should be listed on the columnar sheet in the manner shown by the table entitled "Rates of Turnover" in the foregoing illustration.

At the end of the year, the annual rates of turnover in merchandise and accounts receivable should be calculated. The annual rate of turnover is not found by adding the monthly rates of turnover. It is found in the following manner:

1. Add the balances on hand at the first of each month during the year, including the balance on hand at the beginning of the new year, and divide the total by thirteen to find the balance of the asset.
2. Add the amounts credited during each month and so secure the total amount credited to the account during the year.
3. Divide the amount credited to the account during the year by the average balance. The quotient is the annual rate of turnover for the asset.

Jones Trade Zone Bill Discussed by Banker

The methods by which the United States can develop her foreign trade and at the same time maintain a protective tariff were recently outlined by Henry M. Robinson, Los Angeles banker and former member of the Shipping Board, before the American Bankers' Association in annual convention through his discussion of the Jones "Trade Zone" Bill now before Congress.

Mr. Robinson in summarizing the provisions of the bill pointed out that, whereas, under the terms of the bill, both foreign and domestic merchandise may be brought into a free zone and there be broken up, assembled, and mixed with foreign or domestic merchandise or otherwise manipulated for re-export, direct manufacture as such may not be carried on within the proposed districts,—this in order to meet the wishes of interior communities and to allay their fears as to seaboard manufacture competition.

Mr. Robinson said in part:

"The elimination of port delays would be of tremendous economic advantage, for it is recognized that successful ship operation depends, to a great degree, an keeping the ship at sea.

"It is only through the adoption of a free zone policy that the protectionists, the ship operator and the foreign trader can meet on common ground and all that the Jones bill is attempting to do is to carry out scientifically what we are now doing most unscientifically through our bonded warehouses."

Increasing Production in Industry

Shortcuts in Management and New Power Applications That Have Reduced the Cost of Manufacturing Processes or Increased the Rate of Production. Ideas and Suggestions by Practical Men.

Electric Furnaces Preferred For Brass Melting Process

In answering a query as to whether the saving in metal when using an electric furnace in producing brass is sufficient to pay for the increased operating costs, the following has been received from the Electric Furnace Construction Company of Philadelphia:

"The answer to the question lies in the great number of electric furnaces installed for this purpose. Firms who are operating such equipment in their plant state that the electric furnace competes on a cost basis with the fuel fired furnace and very often shows a saving in cost of metal melted. In comparing operating costs it is necessary to take into account not only fuel costs, but also labor, overhead, interest and depreciation, maintenance and repairs, supplies and metal losses.

"The chief items that will show a saving when melting brass by electricity are labor, supplies (these would include crucibles) and metal losses. Very often the saving in the last two items will show a favorable balance for electric melting on the cost sheet. Against these items must be balanced the fuel cost (electricity), interest on the investment and perhaps maintenance, all of which will be higher for the electric furnace; but if the furnace has been wisely selected so that it will be operated to capacity a fair part of the time, the saving shown by the less metal loss, labor and supplies will more than make up for the increased fuel and interest charges.

THIS DEPARTMENT

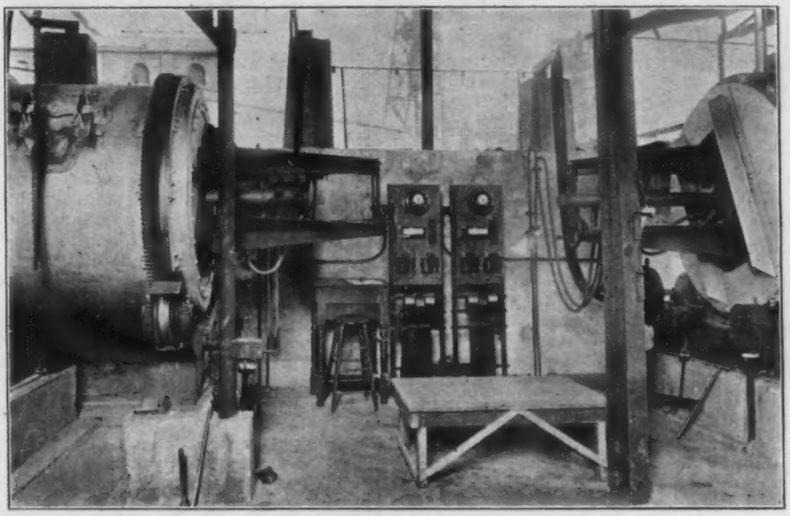
will be devoted to a discussion of practical problems of industrial operation and management. Readers' requests for information will be published in each issue, together with the answers to previous questions. It is hoped that readers will take full advantage of this opportunity to profit by the practical experience of others and to give others the benefit of their own discoveries. Space rates will be paid for answers which are published.

"On the basis of data gathered from firms who have used both types of furnaces, I believe we could unhesitatingly say that the electric furnace will show a saving over the fuel furnace when all the factors above are considered. If the more intangible assets of the former are taken into account, healthier shop conditions, more contented labor, etc., the case for the electric furnace is greatly strengthened."

Two brass furnaces installed by the Oregon Brass Works, Portland, comprising the first installation of the kind on the Pacific Coast, have almost paid the first cost of the equipment in the saving in time, labor and material during the first year of operation, and have proved satisfactory from the standpoint of convenience.

H. DREVER.

Philadelphia, Pa.



First Pacific Coast installation of electric brass melting furnaces at the Oregon Brass Works, Portland, whose economy has almost paid for the equipment in one year of operation.

Amount of Power Required in Heating Processes

In the determination of the amount of electric power required in any heating process, a certain amount of general information must be secured before an intelligent calculation can be made as to the kilowatt hours and the kilowatt demand necessary for a satisfactory application. Points to be considered are:

(1) The material or work to be heated: A given kind of material requires a definite amount of power to raise the temperature of that material one degree fahr. The specific heat has been determined for nearly all materials in use and is one of the factors in heat calculation.

(2) The initial temperature of the material or work, the maximum temperature, and the final temperature to which it will be heated: By initial temperature is meant the temperature at which the material is placed in the oven. This may or may not be room temperature, depending upon whether or not the material has previously been heated, and has had an opportunity to cool off completely. The maximum temperature is that required to produce a certain chemical change or a certain result in the heating of the material. The final temperature is often the maximum temperature, but not necessarily so.

(3) The size of the oven, furnace, or container: With a given exterior surface temperature, the power lost through radiation will be proportional to the exterior exposed surface; hence greater economy will be secured by having the container as small as possible.

(4) The kind of material from which the container is made: The radiation losses depend upon the rapidity with which heat is conducted from the interior surface to the exterior surface of the container. Steel conducts heat 1,000 times as fast as a high grade magnesia or diatomaceous earth; hence, one square inch of steel extending from the inside to the outside of the container will conduct as much heat as seven square feet of high grade insulation. The importance of eliminating bolts, rods ,etc., extending through the container walls may thus be appreciated.

(5) Thickness of container walls: With the heating done in the interior of the container, the rate at which the heat will flow through the walls will be inversely proportional to their thickness. If the losses are a certain value with container walls of a certain thickness, the losses will be reduced to one-

half that value if the thickness be doubled.

(6) Weight of movable and immovable racks or trucks within an oven or other container, and the initial temperature of same: These accessories absorb heat just as much as the work, therefore, in order to determine how much power is expended in the heating of such parts, the weight and initial temperature must be known. It is desirable to have as light racks and trucks as can safely be used, also to maintain them at as high a temperature as possible when not in use by keeping them in the oven with the doors closed when the oven is not in use, or by returning them to the oven as quickly as possible.

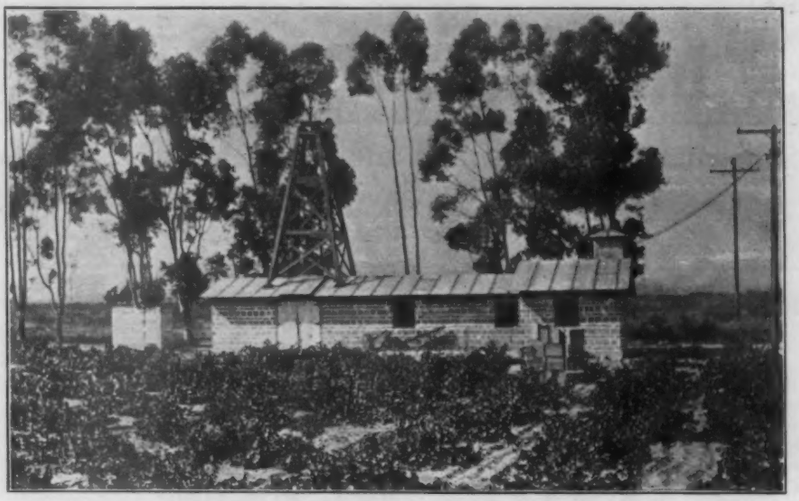
(7) The length of time the oven, furnace or container is out of operation between heats: All substances absorb heat; hence the walls of an oven, furnace or container will absorb a definite amount of heat in a definite temperature rise. The amount of heat initially absorbed by an oven may easily be three or four times that required for the work. If the oven is allowed to cool off completely after each operation, an enormous amount of heat is lost in proportion to that utilized. A heating installation should be designed so that the ovens will always be used at their maximum capacity, and so that when ovens are not in use they may be kept entirely closed.

(8) The amount of moisture to be evaporated: In a drying process, the work may be partly saturated with water, such as in the drying of powders, woods, leather, etc., or a thin film may cover the surface such as enameled or japanned products which are cleaned in a pickling tank, rinsed in clear water, and run into an oven for quick drying before being dipped in the enamel. Incidentally this method has another advantage in that in evaporating the moisture the work is also heated, so that upon being dipped in the enamel a better flow on the material is obtained, the dripping period reduced, the consumption of enamel reduced, and a better finish secured.

Spent Gases Effect Economy of Gasoline Engines

The effect of spent gases remaining in the clearance space of a gasoline engine cylinder at the end of the exhaust stroke has long been a subject of study and controversy on which recent experiments have thrown some new light, according to the News Bulletin of the U. S. Bureau of Standards. Despite a contrary tendency in earlier stages of the gas engine development, exhaust gas has been added to the induction system by recent experimenters in an endeavor to secure higher thermal efficiency.

The results of tests made to study the effect on power and thermal efficiency at full and part throttle when admitting exhaust gas under various circumstances has led the Bureau to conclude that "the dilution of the charge by the spent gases remaining in the clearance volume makes it impossible at low throttles to employ those air fuel ratios which if they could be fired would yield the maximum efficiency."



Electrically driven pumping plant near Los Angeles which, by supplying one square mile of vineyard with water, increased the value of one year's crop by $125,000.

Grape Production Doubled By Electric Pumping Plant

A $40,000 investment in an electrically driven pumping system for watering a 630-acre vineyard was recently made by John L'Afourcade of Cucamonga, Cal., with the direct result that the tonnage of grapes produced was more than doubled. The net value of the crop after the irrigation system was put in operation is said to be $125,000 more than the crop raised without irrigation.

The decision to irrigate was made after L'Afourcade was shown that by actual count 175 grapes from irrigated vines would fill a container that would hold 400 grapes grown without irrigation. The pumping plant was unusually expensive because it had to be designed to deliver 630 gal. per minute under a head of 490 ft., which is said to be a world's record for a pump of this type.

The total electric power costs for pumping 12 hours per day from April 15 to Aug. 15 was less than $4.00 per acre. The entire hydraulic end of the electrical pumping installation was manufactured in Los Angeles.

Larger Dredges Build Higher Levees on Sacramento

World records have been established recently in the development of larger dredges for canal and levee work along the Sacramento undertaken in connection with reclamation and drainage projects. Improvements in the design of dredges built for this service have been based almost wholly on experience gained on the Sacramento River itself. This is largely because nowhere else were such wide canals and high levees being constructed with floating equipment. In fact, works of the size undertaken there were not generally considered feasible with a single handling of material.

Dredges are now in operation on the Sacramento with booms ranging up to 240 ft. in length with which canals having a bottom width of 500 ft. have been built without rehandling the material. The long booms also enable these dredges to construct levees while the dredge floats at levels as much as 40 ft. below the levee crest.

Two factors that have influenced this unprecedented dredge development are the desirability of having a berm at least 30 ft. wide on the river side of the high levees as a protection against sloughing during high water and the need for equipment that could handle even the largest levees during periods of low water.

Dredges with booms long enough to build the highest levees at any stage of the river are fairly sure of work the year round, while those with short booms have a limited field of operation in low water periods and may be idle for a considerable part of the year. The Sacramento Valley practice of basing the rate of rental on the length of boom has also been an incentive to the longer booms. The difference in cost of handling material with large and small dredges is not great but the general rule is, the larger the dredge the greater the yardage.

Painting Boiler Rooms White Aids Illumination

Prevention of accidents, leakages, and explosions from escaping gases or oil has been accomplished on oil burning vessels in the United States navy by the simple expediency of painting the interior of the boiler room and the bilges under the boilers white. Heretofore boiler rooms have been difficult to light satisfactorily because of the lack of reflecting media. This was particularly true of coal burning vessels. With the supplanting of coal by oil, the boilers and pumps are the only parts of the boiler apparatus that need not be given a white coating. In some ships even the boilers have been painted. Experience shows that by painting the bilges underneath the boilers white and by illuminating them with two or three lights, any oil leakages can be readily discovered and repaired before accidents that might occur from the explosion of the gases formed.

Western Dealer, Jobber and Agent

Business building suggestions for the store—
Distribution and warehousing methods—
Advertising and sales promotion ideas

Menace of the Curbstoner to the Contracting Business

BY W. D. MORIARTY
Field Representative
Northwest Electric Service League

There are two kinds of curbstoners in the electrical contracting business, but only one is a menace or the source of unfair competition. The curbstoner who is really a comer, one who is going to make a success and establish himself in business, is an asset to the business as a whole and not a menace. If he is to succeed he must make a profit on what he does. If he is to succeed he must be paid for the time he spends soliciting business as well as for the time he works with tools. Any man who is going to succeed must have business sense enough to know this, and his bid for any job will include not only the cost of materials and a fair price for his labor on the job, but a profit which will pay him for his risk and the time and effort in soliciting business.

The curbstoner who is really a menace to the business is the man who will never make a business success. He may be so devoid of business judgment that he can't really determine how much the material will cost nor how long the job will take him. In times of unemployment there are many such men, some of them really intending to make up by long hours for low bids and some of them willing to bid as low as they need to in order to get the job, even though they know they will never be able to pay the man from whom they bought their supplies.

Sales Increase 4.8 Times With Attractive Window Display

That attractively trimmed windows are effective sales agents was proved some time ago by a test made in San Francisco with 19 electrical retail merchants. For an entire week a record was kept of the sales of these agents of a semi-staple product which they were regularly selling. Then the windows of all the 19 retailers were attractively dressed to display this particular product, and the displays maintained during the following week.

During this second week the aggregate sales of these 19 merchants amounted to 4.8 times the sales which they made during the preceding week.

This record unquestionably shows to electrical retailers the value of attractively trimming their windows with the products which they have to sell.

"Your Home Is Not Complete Without Electrical Convenience Outlets" is a slogan powerful, simple and effective. See that it gets over to the engineer, architect and home builder.

The electrical industry furnished one of three cooperative exhibits at the recent Trade Exposition in Los Angeles. Almost every conceivable electric device and appliance was demonstrated in the booth which was visited by approximately 300,000 people. The exhibit showed in a winning way the convenience and comfort of electrical devices.

Outline of Business Essentials Issued in Denver

Electrical Cooperative League Publishes Resume of Speech for Distribution to Intermountain Contractor-Dealers.

News of activities, announcements and information of value concerning the industry will be presented to members of the Denver Electrical Cooperative League in an informal publication known as "The Bulletin" which is to be issued monthly by the league. The first issue contains a resume of an address given by Laurence W. Davis before a meeting of the electrical industry in Denver on the subject of a successful contractor-dealer's business.

Mr. Davis sets down the fundamentals for a successful business man as follows:

1. He must have a definite purpose, both to make money and to serve well.
2. He must have character backed by aggressiveness, intensity, cheerfulness and open mind and initiative.
3. He must believe in cooperation, in seeking the best from others, in giving the best to others, in supporting his national and local organizations and in reading his trade journals.
4. His business must be founded on the idea of service, an obligation owed to himself, to the industry and to the public.

The location of the contractor-dealer's business is an important factor and should not be measured entirely from the standpoint of rent. Traffic, the opportunity to draw from the passing crowd, the nature of surrounding buildings and business, and the appearance of the store front are of greater importance than the amount of rent.

Economy in the amount of rent paid may prove an asset or a liability, based upon the results obtained in the location selected. To secure a store in a cheap location which does not obtain local trade may make that store a liability; on the other hand, rental of many times that lower amount may prove a great asset if it is balanced by drawing features which give the store a merchandising turnover of sufficiently greater amount. Do not measure rent in dollars and cents but rather as a percentage of the gross business done by your store.

Factors which determine the success of the location of the store rather than the rent include the intensive use of windows, the arrangement of the interior of the store and salesmanship.

Organization is fully as important as any of the qualifications for a good business. In planning the organization points which must be remembered are thorough management by the executive, accounting, financial relations, stock, selling, service and last but not least, advertising and display.

Electrical Homes Opened in Intermountain District

Salt Lake City Home is Visited by 15,000 People During the Two Weeks Period it is Kept Open by Cooperative League While Denver Launches Building Program to be Completed Thanksgiving

Denver's first electrical home is a reality. Through the efforts of the Electrical Cooperative League a desirable site has been secured, construction started and the house will be ready for inspection about Thanksgiving time. Men in the industry were faced with a difficult problem when the decision was reached to build the home. As there was little or no subdivision or special addition development in the city, there was no opportunity to combine the construction with real estate or building firms. The league organized its own company and incorporated for $25,000, all capital stock. Money necessary for immediate developments was subscribed by the industry and stock issued in return. Firms handling all types of building material agreed to accept stock in payment for material. The organization which will build the home is known as "The Electrical Home Building Company." Officers have been elected and a home building committee selected, which is supervising the work.

Architects' conception of the electrical home which is being constructed in Denver by the Electrical Cooperative League and which is to be completed by Thanksgiving.

The house, the plans for which were drawn by E. P. Varian, will be modeled after the California-Spanish type of architecture. It will include seven rooms in which there will be more than one hundred convenience outlets. Features in the construction of the home will be a variegated tile roof and tinted stucco exterior finish. No detail will be left undone to make the home as attractive as the California and other homes have been. More than fifty electric appliances will be demonstrated.

The site selected is two and one half miles from the business district of the city on one of the main connecting links in Denver's boulevard system, in a section where the houses are of a quality in keeping with the Electrical Home. The league members propose to erect other electrical homes in various districts of Denver and in other cities of the state as soon as the present undertaking is completed.

As an example of an up-to-date home for people of moderate circumstances demonstrating the newest and most convenient methods of house wiring for the use of electric appliances and correct, harmonious illumination, the Salt Lake City Electrical Home has been added to the list of the score or more such houses in the West either completed or under construction. Built under the direction of the Rocky Mountain Electrical Cooperative League, the home was visited by approximately 15,000 people during the period of September 17 to October 1.

The home was constructed by L. B. Swaner and equipped with electrical appliances under the direction of the league. It contained approximately 150 outlets and 50 switches so arranged as to afford every convenience to the housewife. The house was fashioned after the New England type of architecture and included seven rooms together with a basment and a garage.

During the period the house was open for inspection guides were furnished who explained the practicability of every outlet and appliance to the visitors. In a prominent place in the house was a sign which read: "No solicitation, demonstration, or quotations made during this exhibition. Information wil be cheerfully furnished by any electrical dealer."

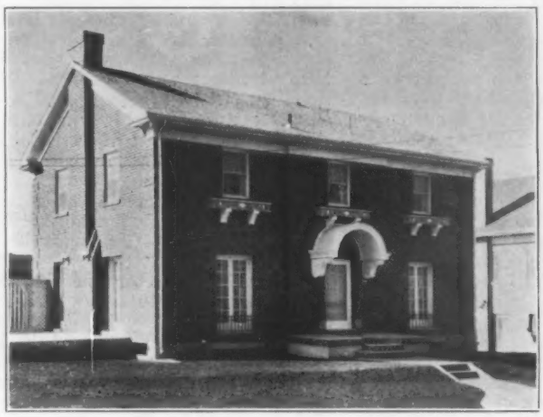
Each room carried an individual and distinctive tone not only in the arrangement of the lights but also in the general effect. Wall brackets and portable lamps furnish the illumination in the living room. There is an electric log in the fireplace and an electrically operated piano and cabinet phonograph. The main bedroom is provided with bracket lamps in conjunction with boudoir lamps on the dressing table. A master switch at the head of the bed controls four cornice lights on the exterior of the house which are designed to provide a sense of security from night prowlers.

The dining room is arranged in an ideal manner for electric service. The room is lighted from a central fixture. The floor outlet under the table permits the use of cooking appliances without disconnecting any of the lamps. A porcelain plate, permitting the use of more than one appliance at a time, is placed underneath the table top. The buffet is provided with a duplex outlet for attaching two candle sticks and another for cooking appliances. The tea cart is wired for the use of electric appliances and may be attached in any of the rooms. The kitchen is also complete in every detail from the electric range to the electric exhaust fan for ventilation.

The home is provided with an electric refrigeration plant located in the rear hall. The laundry is also fully equipped with modern labor saving conveniences for the housewife.

In the furnace room the temperature of the house is regulated by automatic regulation of the dampers by thermostatic control. The garage contains an electric soldering iron, a bench motor, rectifier, and a portable air compressor for pumping up tires.

Officials of the Rocky Mountain League agree that the electrical home is an immense factor in the education of the public to a real understanding of the doctrine that electricity is the modern servant in the home.



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The interior of the Electrical Home in Salt Lake City contained every modern convenience for the housewife. The interior of the living room shows the simplicity characteristic of the type of homes built in the West.

Make It an Electrical Christmas and How to Do It

Cooperative Advertising as the Basis of a Holiday Sales Drive for the California Electrical Cooperative Campaign

Cooperative advertising among dealers in certain types of commodities is detrimental. Competitive advertising rather than cooperative is the life of those businesses founded upon the sale of necessities. There will always be a demand for meat, so why should the butchers pool their advertising fund? Instead they must advertise competitively—presenting the reasons why customers should patronize them in preference to the shop across the street. There would be nothing gained by cooperative advertising of the fact that two grocers sold the same thing. And so it is with bakers, dairies, clothiers and shoe merchants.

And there is another class of dealer who would derive no profit from cooperative advertising. The dealer in non-essential products which are already in demand. For example, a bookseller, a florist and a candy merchant. Such dealers must advertise individually, and feature their individuality, to realize their returns upon their advertising.

But a different condition exists for the dealer in products for which there is no demand. And in this class is the electrical dealer. He could spend hundreds of dollars advertising the fact that he had electrical appliances for sale; but if there was no demand for electrical appliances he would realize but small returns on his expenditures. And his individual advertising can do but little toward creating a demand. To accomplish that requires thousands of dollars, where he has but hundreds to spend for the purpose.

The potential market of the electrical dealer can never be opened until a demand for electrical appliances is created and that never can be accomplished by a little sputter of advertising on the part of one dealer, then a little sputter of advertising on the part of another. There is only one way that we can ever hope to open wide the market—a consolidated and cooperative effort on the part of the entire electrical industry to show the public why it should use electrical appliances, thereby creating demand. After that, on with the individual advertising, and on with the competition. For after a good, healthy demand has been born competition is the nurse which will mother it into manhood.

With this goal in view an effort is being made by the California Electrical Cooperative Campaign to make this coming Christmas an electrical Christmas. There is an increase in business in the proposition for every dealer of electrical appliances if it goes over. If it fails he will be where he is today.

When it is said that plans are being laid for such a sales campaign it does not mean that the Cooperative Campaign is going to send a letter to each dealer telling him he should exert special effort to sell more appliances at Christmas time than during other periods of the year. Real, definite, constructive plans are being made for a campaign, which, to go over, must have behind it the shoulder of the entire industry. There will be included special window trims, slide advertising, newspaper advertising, direct mail, and addresses to club luncheons and meetings.

The week of December 4-10, inclusive is to be known as Electrical Week, and every effort is to be made to have it recognized as such outside the industry as well as within. Although the pressure of the campaign is to be brought to bear during the entire period from the middle of November until Christmas, the main force will be exerted during the first week of December, Electrical Week."

The slogan adopted for this campaign is "Electrical Gifts are Practical Gifts—Make it an Electrical Christmas;" and this message is to be hammered home by every possible means.

The fate of this sales campaign lies in the hands of the industry. The Cooperative Campaign can plan sales-promotion, but it cannot move goods off the dealers' shelves; that, to be accomplished, requires real cooperative effort to put the plans across.

Absolute faith that "the campaign will go over" and an individual determination to personally see that it goes over will result in its success and increased sales. But we must work together.

All must aid in putting over the slogan, "Electrical Gifts are Practical Gifts—Make it an Electrical Christmas". One of the cheapest ways in which this message can very effectively be driven home is for every member of the electrical industry to estimate approximately how many letters he sends out in a month, then send that many letterheads and envelopes to the printer and have the campaign slogan printed on them in clear, red letters. Across the top of the letterheads and envelopes it should read "Electrical Gifts are Practical Gifts"; and across the bottom "Make it an Electrical Christmas". In this way every letter sent out by anyone in the electrical industry will tell the same story; and the day-in-and-day-out repetition of that message for one month cannot help but register upon the minds of the public. Your correspondence must be carried on anyway so the only additional cost would be two or three dollars per thousand for printing the slogan on your stationery.

Christmas time isn't a long way off and Christmas buying will start before very long. Shall we sit back and watch the opportunity pass as it has other years, or shall we work together to see that the electrical industry gets its share of the Christmas business?

Apartment Houses Are Promising Field for Electric Heating

The effectiveness of electric heating in apartment houses, hotels and homes can no longer be overlooked. There has been installed in the Merritt-Grand Apartments in Oakland, California, a complete electric heating equipment consisting of individual units in each room. Each apartment contains a 1400-watt Majestic heater in the living room and vestibule and a 900-watt heater of the same make in the dining room. The heaters are wired to one meter and the current furnished to the tenants without charge. The flexibility and cleanliness of this type of heat are two of the greatest arguments in its favor. Much has been made of this in advertising by the owners of the apartments and it is stated that other similar installations are planned to meet the competition. The illustrations show the exterior of the apartment, which is one of the most exclusive in the city, and the arrangement of one of the living rooms.

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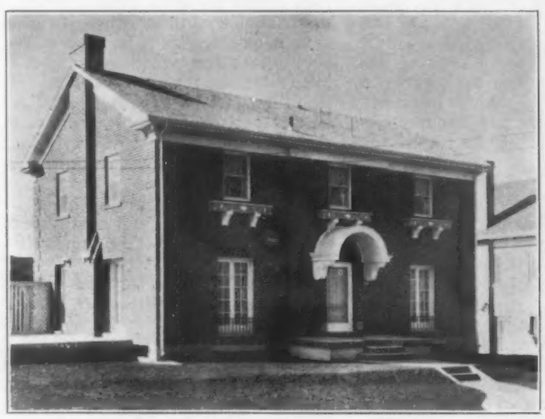

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The fate of this sales campaign lies in the hands of the industry. The Cooperative Campaign can plan sales-promotion, but it cannot move goods off the dealers' shelves; that, to be accomplished, requires real cooperative effort to put the plans across.

Absolute faith that "the campaign will go over" and an individual determination to personally see that it goes over will result in its success and increased sales. But we must work together.

All must aid in putting over the slogan, "Electrical Gifts are Practical Gifts—Make it an Electrical Christmas". One of the cheapest ways in which this message can very effectively be driven home is for every member of the electrical industry to estimate approximately how many letters he sends out in a month, then send that many letterheads and envelopes to the printer and have the campaign slogan printed on them in clear, red letters. Across the top of the letterheads and envelopes it should read "Electrical Gifts are Practical Gifts"; and across the bottom "Make it an Electrical Christmas". In this way every letter sent out by anyone in the electrical industry will tell the same story; and the day-in-and-day-out repetition of that message for one month cannot help but register upon the minds of the public. Your correspondence must be carried on anyway so the only additional cost would be two or three dollars per thousand for printing the slogan on your stationery.

Christmas time isn't a long way off and Christmas buying will start before very long. Shall we sit back and watch the opportunity pass as it has other years, or shall we work together to see that the electrical industry gets its share of the Christmas business?

Apartment Houses Are Promising Field for Electric Heating

The effectiveness of electric heating in apartment houses, hotels and homes can no longer be overlooked. There has been installed in the Merritt-Grand Apartments in Oakland, California, a complete electric heating equipment consisting of individual units in each room. Each apartment contains a 1400-watt Majestic heater in the living room and vestibule and a 900-watt heater of the same make in the dining room. The heaters are wired to one meter and the current furnished to the tenants without charge. The flexibility and cleanliness of this type of heat are two of the greatest arguments in its favor. Much has been made of this in advertising by the owners of the apartments and it is stated that other similar installations are planned to meet the competition. The illustrations show the exterior of the apartment, which is one of the most exclusive in the city, and the arrangement of one of the living rooms.

Activities of the West

A Business Man's Department Devoted to Events and Developments in Western Industrial Centers — Including News of Interest to Readers in Public Utility, Industrial and Trade Fields

New Project Planned in Utah

Los Angeles Man Proposes 500,000 Hp. Hydroelectric Development

William Schuyler Post, of Los Angeles, has filed application with the state engineer of Utah for the use of 8000 second-feet of water from the Green river with which to develop an estimated 500,000 hp. in electrical energy. The plan is said to be backed by individual Los Angeles capitalists and has no connection with the projects of the Southern California Edison Company for development of power on the Colorado river, of which the Green river is a tributary.

The filing contemplates a dam 150 ft. in height, and a reservoir for the storage of 1,500,00 acre-feet of water.

The filing of Mr. Post is for the diversion of waters, which means the entire flow of the Green river at a point about a mile south of the confluence of the Minnie Maud creek with the Green river. There he plans to place a dam 150 ft. in height, and thence would conduct the water by gravity thirty-five miles by canal to a point about ten miles up the Green river from the city of Green River. He estimates, according to the application, that he would obtain a head at that point of 750 ft. and that with this volume of water, 8000 second-feet, he could develop 500,000 horsepower.

The canal, according to the application, would be ninety feet wide at the top, fifty feet wide at the bottom, and would carry water twenty feet deep. Twelve 5000-horsepower turbines would be installed and the power would be used in municipalities or on railroads in Utah and neighboring states.

Gypsum Corporation Is Formed By Los Angeles Men

Formation of the California Gypsum Corporation with an authorized capital of $3,000,000 has been perfected in Los Angeles. The company owns 1200 acres in Imperial county, twenty-two miles northeast of El Centro, which contains vast deposits of the non-metallic substance.

The company has announced that it will build an 18-mile railroad from Coyote Wells to the mines while a grinding and calcining plant is being erected there. The plant will have a capacity of 100 tons daily for bulk shipment to Los Angeles and San Diego. Later it is proposed to erect a 500-ton plant in Los Angeles for the manufacture of wall plaster board and partition blocks.

The two plants and the railroad are estimated to cost more than $1,000,000. Charles F. Guthridge, one of the founders of the Home Telephone Company, is president of the corporation.

Tacoma to Spend $900,000 on Harbor Development

Facilities to be Added to Port Terminal for Increased Trade; Will Install Electric Cargo Handling Equipment

Harbor terminal facilities of the port of Tacoma are to be immediately increased to handle the rapidly developing foreign trade of that city, following the sale of $900,000 in bonds recently voted for the construction of a huge addition to Pier No. 2, one of the units of the city's new port terminal. Bids are to be issued shortly for erection of a wharf and terminal sheds at the pier.

When the contemplated addition is completed, Pier No. 2 will be 674 feet wide and 1200 feet long, with transit sheds 180 feet wide on each side of the pier. In the center will be a multiple story warehouse of reinforced concrete and steel. On each face of the pier will be two standard gage railroad tracks on a level with the dock and behind each transit shed will be four standard gage depressed tracks. The transit sheds will provide clear headspace of 25 feet from the floor to the roof trusses.

The present plans call only for the erection of one transit shed and the completion of one side of the dock. The Tacoma Port Commission points out that the funds from the bond issue are sufficient for but a part of the proposed developments.

A portion of the bond issue will be used for the purchase of additional cargo handling equipment, most of which will be automatic and electrically operated. Funds are also on hand for the primary unit of the massive cold storage plant which is to be constructed in conjunction with the terminal facilities. When completed the cold storage plant will have a capacity of 1,000,000 cubic feet and will cost between $350,000 and $400,000.

Included in the equipment which will be installed in the warehouse and transit shed are a series of monorail electric carriers with a speed of 700 feet per minute for expeditiously handling freight. On the face of the dock will be four pillar type traveling boom-cranes for unloading cargoes from the ships to cars. A stiff-leg derrick of 100 tons capacity will be placed at the water extremity of the dock for handling heavy freight, either from cars or barges to the vessels. Locomotive cranes of various capacities will also be purchased as a part of the new equipment.

It will be necessary to dredge approximately 500,000 cubic yards along the face of the pier to make it accessible for the larger types of ocean-going vessels without the use of tugs.

Officials estimate that the total cost of the terminal facilities when completed will be $2,500,000. Work on the additions to Pier No. 2 is to be rushed so that the facilities will be sufficient for handling the commerce of the port next year.

Portland Power Company Issues $10,000,000 in Stock

In order to provide capital for extensions and betterments, but primarily to finance the construction of a large hydroelectric project, the Portland Railway Light & Power Company has authorized the sale of $10,000,000 of 7 per cent prior preferred stock, which will be sold in blocks as the money is needed. Much preliminary work has already been done on the so-called Oak Grove project which is capable of an ultimate development of 60,000 kw., and actual work will be started on the first unit of 20,000 kw. within the next year if proper financing can be accomplished. The large storage possibilities of this project insuring high load factor on the plant under all conditions render this one of the most desirable developments yet to be undertaken in this section. It is estimated that it will take three years to complete the first unit of the proposed plant and additional units will be added as demand for electric power make it necessary.

Pacific Gas & Electric Company Finishes Bartle Railroad

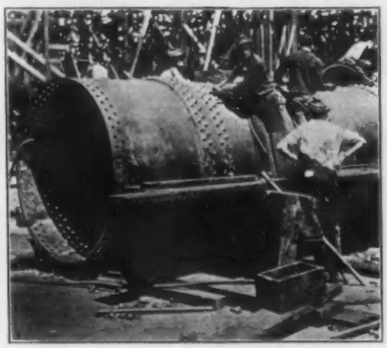
The last spike in the Pacific Gas and Electric Company's 33-mile railroad from Bartle to Pit River in Shasta county, California, has been driven and the line is now operating carrying freight to the power plants under construction on the Pit River. According to O. W. Peterson, chief engineer, the road has cost $500,000. Four hundred men were employed on the line which including six trestles. Farmers in the district have endeavored to have the line declared a public utility, thus giving them an all rail outlet to the markets. No action has been taken on the question but the company has agreed to haul the farmer's freight and products so long as it does not interfere with its own haulage.

Thousands of people visited the First Annual Industrial Exposition held in Oakland, California, during the first week in October for the purpose of arousing interest in home products.

Los Angeles Shipyard Turns Out Huge Penstock Unit

That shipyards will be able to turn their facilities to good industrial use and fill in the curve of production which has suffered from the slump of shipbuilding, is the belief of those familiar with the situation.

Recently a steel pipe six feet in diameter, 22 ft. 3 in. long, formed of marine steel 1 1/16 inches thick and weighing 13 tons, was quickly fabricated at the plant of the Los Angeles Shipbuilding and Dry Dock Company to replace a



Western ingenuity was recently demonstrated when a Los Angeles shipyard in short order fabricated a huge steel pipe to replace a portion of the broken penstock on one of the Southern California Edison plants.

broken section in the penstock of the Big Creek station No. 8 of the Southern California Edison Company.

This section of penstock was subject to full pressure of the 800-ft. head and without any stay-bolts was put together with 1600 of the largest rivets used in this section of the country, namely 1⅝ inches. In order that no time might be lost the pipe was hauled overland by motor trucks with relief crews to make the long drive north without delays in route.

California Syndicate Files on Potash Tract in Utah

A syndicate of California business men has filed upon 25,000 acres of potash land in Utah extending from the west boundary of the property of the Utah Salduro Company, on the shore of the Great Salt Lake, almost to the Nevada line.

The filings were made on behalf of the California people by Frank Cook, a civil engineer of Salt Lake City. The application is for the lease of this vast acreage for the development of plants and extraction of potassium contents.

If the present plans of this syndicate are carried out it will mean the development of a gigantic industrial enterprise for Utah, especially if the proposed government tariff on potash products is finally passed.

A series of comprehensive charts suitable for filing which show the industrial, transportational and economical advantages of the city of Portland have been prepared by the Portland Chamber of Commerce. The charts include exhaustive data arranged in a most comprehensive form and will be sent out to various manufacturing and industrial firms throughout the country.

Optimistic Outlook For California Manufacturers

Industrial Survey of 600 Plants Made by Association Shows Situation Improved in All Basic Industries

Official statements concerning unemployment and business conditions in California overestimate the situation, according to a complete and comprehensive industrial survey compiled from the thousand members of the California Manufacturers' Association and just issued. Questionnaires were sent out to the entire membership and 600 replies received from the majority of the important industrial plants of the state giving exact data on both the industrial and business situation.

The questionnaire was very brief, asking only for a comparison of sales, output, workers employed and wage reductions with a normal year. The recipient himself was to determine what a normal year had been in his industry.

Optimistic reports were sent in by the following industries: food products, furniture, mattresses and pillows, oil, paints, paper boxes, picture frames, and printing. Manufacturers of lumber, millwork and boxes, and the sewing machine trades reported fair business conditions, slightly below normal. The most marked depression was shown in the metal industries, most of which are apparently marking time. Glass and leather plants also seemed to be in the doldrums.

J. R. Millar, president of the association and vice-president and general manager of the California Cotton Mills, Oakland, has made the following comment on the situation:

"It must be borne in mind that even though sales reports might be favorable, it does not follow that profits were satisfactory. Marking-down seemed universal.

"Regarding output as compared with capacity, many industries expanded and installed facilities during the war period, that are not required in normal times. Others again, have never run their plants to capacity.

"While there has undeniably been a diminution of workers employed—this has been due in many instances to the inevitable weeding-out of the inefficient—there seems to be every effort to hold proved and capable crews. This is sensibly put by one executive who writes, 'Highly skilled and trained employes simply cannot be laid off and re-employed at will. Am holding them, trusting for a revival.'

"Wage reductions, apparently, have been made reluctantly, if at all. Competition outside the state has been the chief cause, although decreased cost of living has also been a factor. Employers of women cannot make wage reductions because of state minimum wage orders. Many plants are reducing only in the case of new employes."

Examples of the data secured in some of the more important industries of the state follow:

Canning and Packing:

SALES are favorable with more than half of those reporting, and 86 per cent is the lowest percentage given, although many plants have closed or been consolidated. OUTPUT ranges from 1/3 to full capacity and averages 70 per cent. WORKERS are employed almost as numerously as in a normal year, the average being 80 per cent. WAGE REDUCTIONS of 10 per cent to 25 per cent have been made in almost every plant, with overtime and bonus payments eliminated. WAGE SCALES vary from 35 cents to 40 cents straight time for common labor and 60 cents to machinists.

Cement, Lime and Plaster:

SALES off 50 per cent, OUTPUT 25 per cent to 33 1/3 per cent of capacity (seriously affected by recent industrial differences). EMPLOYEES reduced in number and 7½ per cent in wages. WAGE SCALES QUOTED: Common labor, 40 cents, 10 hours; mechanics, 60 cents to 80 cents, 10 hours.

Foundries:

SALES are uniformly below normal, ranging from 25 per cent to 90 per cent with the bulk of the business around the 50 per cent mark. OUTPUT is equally spotty, ranging from 20 per cent to 70 per cent with an average of 43 per cent of capacity. WORKERS employed number about one-half those in a normal year. WAGE REDUCTIONS of from 7½ per cent to 15 per cent have been made, most of them being 10 per cent. WAGE SCALES GIVEN: Moulders $7.12 to $6.50; mechanics $6.96 to $5.75; specialists $5.60 to $4.72; common labor $4.50 to $3.50.

Lumber Millwork and Boxes:

SALES run from zero to 100 per cent among the large number reporting . A fair average would be about 65 per cent of normal. The recent building tieup in Northern California has affected this industry adversely. OUTPUT averages fair, a composite of all reports showing almost 70 per cent. WORKERS EMPLOYED are equal numerically in several instances to normal crews, the average being 73 per cent. WAGE REDUCTIONS have been made almost without exception, or are contemplated. The reductions have been various, running from 7½ per cent to 20 per cent, with 10 per cent more to come off soon. WAGE SCALES reported are: Machine operators and bench hands $7.40, $5.00 to $7.00, $7.35; mechanics $6.50 to $7.00; cabinet men $5.00-$6.00; lumber handlers $3.40 to $3.60; timber fallers 50 cents, buckers 45 cents, engineers 50 cents, mill hands 40 cents; common labor receives from $2.65 to $4.50.

Machinery:

SALES show an average 50 per cent of normal, with one peak of 75 per cent and lowest 25 per cent. OUTPUT ranges from 75 per cent to 15 per cent of capacity, with an average of 45 per cent. WORKERS employed number only 57 per cent of a normal year, only one reporting plant employing 90 per cent, and another stating workers' efficiency has declined 40 per cent. WAGE REDUCTIONS have been universal, or are contemplated. They range from 5 cents per hour to 10 per cent, and bitter complaints are made of the difference between wage scales in the East and our own. WAGE SCALES QUOTED: Machinists 60 cents to 85 cents, moulders 65 cents to 85 cents, machine operators 60 cents, toolmakers 85 cents up, helpers 45 cents to 65 cents, welders 75 cents, apprentices 30 cents, common labor $3.20 to $4.00.

Two Rail Extensions Planned in Southern California

Some of the richest agricultural land in Southern California will be given direct rail connections for disposing of its products as the result of two proposed extensions of the Los Angeles and Salt Lake Railroad. Applications have been made to the Interstate Commerce Commission and turned over to the State Railroad Commission for initial approval. The extensions are from Whittier to Santa Ana, a distance of 14 miles, and from Whittier to to Tustin, 22 miles, both in Orange county. The estimated cost of the two roads is between $1,500,000 and $2,000,000.

Carriers Plan Perfect Package Campaign Next Month

All trades and industries have been asked to participate in the "Perfect Package Movement" to be inaugurated by the railroads, steamship lines and express companies of the United States and Canada during November. The purpose of the movement is to stimulate public interest in the proper packing of shipments and to enable the carriers to improve the transportation service of the country. Reports on faulty shipments from each city and town in the country during the month will be kept and a table of percentages published.

Mining Laboratory Dedicated

Recent Acquisition of Washington University is Seventh on Program

The University of Washington's new mining laboratory which will be used jointly by the State School of Mines and the Northwest Experiment Station of the United States Bureau of Mines has been completed and formally dedicated. It comprises the fourth building on the university campus to be devoted entirely to mining and the seventh of the institution's new building program.

Research in the new laboratory is to be devoted mainly towards coal mining and ceramics with plans calling for the study of electro-metallurgy in the fu-

New laboratory of the University of Washington School of Mines, recently completed at a cost of $120,000 and to be used partly for electro-metallurgical research.

ture, with a view of aiding in the development of the state's hydroelectric power and vast mineral resources.

The laboratory cost $129,000, is four stories high and is built of reinforced concrete, terra cotta and brick.

Pacific Coast Division, N. E. L. A. to Convene in April 1922

The 1922 convention of the Pacific Coast Division, N. E. L. A., will be held in Riverside, Calif., in April of next year as the result of action taken by the executive committee of the association at a meeting in Los Angeles on September 15. The early action was taken to avoid any conflict with other meetings of the electrical industry.

President A. B. West reported that there was no objection on the part of the National Association to the election of jobbers or contractor-dealers as members of the executive committee of any division, and that employes of municipal plants might be elected to associate membership provided they were approved by the executive committee. It was the opinion of the committee that a flat membership rate of $10 for jobbers should be placed in effect.

Reports from the committees appointed at the last convention all show active work of the year to be under way. Budget requests were approved with the understanding that a new policy of committee expenditures will be adhered to. In the future member companies will pay the living expenses of their representatives while away on association work and only the railroad and pullman fares will be charged to the various budgets. This will make it possible for a more active participation in committee work without increasing the expense of the association.

California Manufactures Show Huge Growth

California stands fifth in the number of manufacturing industries and eighth in the value of manufactured products of all the states in the Union, according to figures just given out by the United States Bureau of the Census for the year 1919. In that year California produced manufactured goods valued at $1,981,443,000, an increase of 178 per cent over 1914. Other striking figures in the census of manufacturers in California are as follows: (1) The number of manufacturing establishments increased 18.8 per cent; (2) The number of wage earners increased 74.8 per cent; (3) Primary horsepower increased from 491,025 in 1914 to 768,858 in 1919, or 56.6 per cent; (4) Capital invested increased 81.1 per cent or from $736,105,000 to $1,333,382,000; (5) Payrolls increased 169.9 per cent or from $140,843,000 to $380,135,000.

California Commission to Hear Power Company Rate Cases

Hearings to establish a basis for rate adjustments of the principal electric power companies in California have been scheduled in San Francisco by the State Railroad Commission for the three months beginning October 25, with Commissioner Chester H. Rowell presiding. The companies affected are the Pacific Gas and Electric Company, the Great Western Power Company and the San Joaquin Light and Power Corporation.

This will be the first time that a complete survey of these companies will have been made, a definite rate basis established and a reasonable rate of return decided upon. The action of the commission follows applications made a year ago by the companies for increase in rates and surcharges. At that time a 15 per cent surcharge was granted which has since been decreased to 6 per cent. In the meantime engineers of the commission and representatives of the cities affected have been checking the valuations of the companies.

Included in the hearings will be the complaints of the cities of Grass Valley, San Francisco, Sacramento and Oakland, all of which are asking for a reduction of rates. The Pacific Gas and Electric Company will be the first to be considered by the commission.

The Northwest Electrical Service League has adopted a standard plan for wiring a five-room house and garage which is being sent out to all persons to whom building permits have been issued. Building contractors, wiremen and architects have also been supplied with the plans.

The Southern California Edison Company has filed on the Boulder Canyon site in the Colorado River, according to advices received from Washington on October 14. According to the report from the Federal Water Power Commission, this new site adds a million potential horsepower to the development already contemplated by the company. The sites on which filings have been made include Boulder Canyon, Pyramid Canyon, Glen River Canyon, Marble Canyon and two other sites between Marble Canyon and the latest site filed upon. The aggregate potential power of all of these sites is estimated at 3,400,000 horsepower.

Tacoma Exposition Successful

Electrical Show Demonstrates Advantages of Appliances and Conveniences

Unqualified success marked the outcome of the Electrical Exposition held in Tacoma, Washington, September 28, 29, 30 and October 1, under the auspices of the Northwest Electrical Service League and Tacoma interests. It is estimated that forty per cent of Tacoma's population visited the displays during the four days.

The exhibits which were placed in the new city light department warehouse, covered displays of industrial electrical equipment, scientific apparatus, commercial equipment and household ap-

LET ELECTRICITY DO YOUR WORK
ELECTRICAL SUPPLIES
SEE THE LITTLE "EARLY RISER" ALONE FOR ANY LAZY HUSBAND
SHAVE HAIRCUT SHAMPOO ALL IN THREE MINUTES
DO IT ELECTRICALLY
I THANK YOU
X-RAY FOR POLICEMENS' HELMETS

Tacoma newspapers aided in making the Tacoma Electrical Exposition a success in many ways. The above cartoon by Reynolds is reproduced from one paper.

pliances. The biggest feature of the show was the giant electrical mountain locomotive furnished by the Chicago, Milwaukee and St. Paul Railroad.

Large manufacturers cooperated with local dealers and jobbers in making the exhibits as interesting as possible to the public. Charts and diagrams were used to demonstrate the construction of motors and generators and for educating the spectators in the increasing use of electrical equipment. Domestic "electrical servants" were one of the biggest features. Skilled cooks prepared meals on electric ranges in one room while in others demonstrators were kept constantly busy explaining the various advantages in "doing it electrically."

Considerable comment, all of which was favorable, was aroused in the press of the entire Northwest concerning the exhibition, which will be the foundation for Tacoma's participation in the Portland Exposition in 1925.

A force of a dozen engineers has been placed in the field by the Division of Engineering and Irrigation of the California State Department of Public Works for the purpose of making a complete survey of the water resources of the state. The sum of $200,000 was appropriated by the state legislature for the survey.

Would Erect Office Building

San Francisco Electrical Development League Hears Plans for Big Structure

Tentative plans for an "Engineering and Industry" building to be erected in San Francisco at a minimum cost of $2,000,000 and to be financed entirely by men in the industry were presented to the San Francisco Electrical Development League on October 10 by a committee headed by Robert Sibley, editor of the Journal of Electricity and Western Industry.

The committee reported that the structure, which would be at least twenty-five stories in height and located in the heart of the San Francisco business district, would be owned and operated in a democratic manner, being financed by between 1000 and 2000 personal subscriptions of $200 each. Under the present plans the building would house all organizations engaged in the upbuilding of engineering and industry in the San Francisco bay region. Reservations for office space in the structure would be disposed of in the order of application. It is believed that the building could be ready for occupancy by January, 1924.

The arrangements for the control, financing and construction of the building would be placed in the hands of a board of regents selected from among the foremost men in the industry. The Electrical Development League placed at the disposal of the board of regents $150 which is to be used to forward the initial organization of that body. The following have been suggested to comprise this board:

Members at Large

John A. Britton, vice-president and general manager, Pacific Gas & Electric Company.
W. E. Creed, president, Pacific Gas & Electric Company.
Mortimer Fleishhacker, president, Great Western Power Company.

Advisory Committee

C. L. Chamblin, president, San Francisco Electrical Development League.
J. E. Woodbridge, president, San Francisco Engineers' Club.
J. D. McDonough, president, California Development Association of Agriculture and Industry.
B. M. Rastall, Industrial Department, S. F. Chamber of Commerce.
C. D. Marx, president, Joint Engineering Council of San Francisco.
E. C. Hutchinson, chairman, San Francisco Section, American Society Mechanical Engineers.
W. P. L'Hommedieu, chairman, San Francisco Section, American Institute Electrical Engineers.
F. L. Sizer, San Francisco Section, American Institute Mining and Metallurgical Engineers.
Bryant S. Drake, American Chemical Society.
F. R. Muhs, American Society Civil Engineers.
Chester Brown, San Francisco Chapter Association of Engineers.
J. R. Millar, president, California Manufacturers' Association.
Earl Brown, president, Cal. Ass'n Electrical Contractors & Dealers.
C. E. Grunsky, past president, Commercial Club.
Harry Bostwick, president, Pacific Coast Gas Association.
Robert Sibley (ex officio), editor, Journal of Electricity and Western Industry.

Commission to Adjust Various Colorado Claims

Engineer States That Body Is Almost Ready to Hear Proposals of States For Power and Water Rights On River

"The Colorado River Commission created by the League of the Southwest is collecting the physical data relative to the available water supply and irrigable areas in the Colorado River Basin to be used in the adjustment of the claims of the various states for power and irrigation," according to a letter just received from Addison J. McCune, state engineer of Colorado and chairman of the Colorado River Commission.

It is planned to submit the findings of the Colorado River Commission to a treaty or compact commission to which the five interested states have already appointed delegates and which will be complete when President Harding appoints a member to represent the federal government. The Colorado River commission is to be continued in the capacity of consulting engineers for the compact commission.

These commissions are expected to simplify procedure in bringing together all the interests involved so that development may proceed without unnecessary delay and litigation. "The U. S. Reclamation Service," Mr. McCune states, "has already collected sufficient information relative to the water supply of the basin to show that there is enough water for the irrigation needs of the whole basin if properly handled. Consequently irrigation development in any particular territory need not be halted to any appreciable extent.

"The power problem is somewhat different. We assume that irrigation should take precedent over power since, taking the basin as a whole, much of the territory will be without a market for power unless there is irrigation development. But large power units cannot be developed without great storage basins. In most cases it is hoped these can be planned so as to be utilized both for power and irrigation, and in such cases both interests can share in the cost of construction and maintenance. Some delicate problems may arise in this connection which will have to be ironed out and on which the commission should be able to give material aid.

"Looking to the operation of this basin as a whole, the configuration of the country is such that the various irrigation units can be operated independently and should by all means be so operated, but we can conceive of a time when the water power of the basin may give the best service by being tied together and operated as a unit."

The headquarters of the California Electrical Cooperative Campaign have been moved from the Pacific Building to the Rialto Building in San Francisco. R. L. Eltringham, manager of the campaign, suggests that men of the industry make the new offices their headquarters when visiting in San Francisco.

One hundred and seventy-five emissaries of the San Francisco Chamber of Commerce left recently for the Orient on the steamer Empire State for the purpose of promoting closer relationship between San Francisco and the merchants of the Far East. Government, municipal officials and business leaders in each country will be interviewed. A survey of natural resources will be made and trade activities and possibilities studied. The tour marks the first time that a civic organization has attempted this direct method of approaching the larger problems of international trade.

Hat Creek Power House No. 2, a part of the Pit River development of the Pacific Gas & Electric Company in Shasta county, California, was placed in operation October 1, just a month following the opening of No. 1 power plant. The two plants are almost identical and develop 12,500 kw. each.

Ben F. Read, president of the Mountain States Telephone Company, who gave the convention visitors a powerful message in his speech on the strides which are being made in the Rocky Mountain District.

Officers of the Rocky Mountain Division and the Colorado Electric Railway, Light and Power Association: (left to right) E. P. Bacon, Fred Norcross, E. A. Phinney, T. C. Kennedy, A. C. Cornell, Arthur Prager and D. C. McClure.

M. R. Bump, national president of the N. E. L. A., who was forced to leave the Rocky Mountain Division convention to attend the Great Lakes Convention a few days later. Mr. Bump was one of the principal speakers.

CONVENTION FIGURES AT GLENWOOD SPRINGS, COLO.

California Cooperative Campaign Selects New Chairman

Reorganization of the California Electrical Cooperative Campaign from the chairman of the advisory committee down has resulted from the resignation from the chairmanship by L. M. Newbert, Oakland district manager of the Pacific Gas & Electric Company. A. W. Childs, superintendent of sales for the Southern California Edison Company, has been unanimously chosen as the new chairman.

Following the announcement of the resignation of Mr. Newbert, A. G. Wishon, former member of the committee and general manager of the San Joaquin Light and Power Corporation, was chosen for the position of chairman, but had resigned before being notified. Mr. Child's appointment followed the receipt of Mr. Wishon's resignation.

Other changes in the committee include the appointment of J. B. Black, sales manager of the Great Western Power Company, to succeed Mr. Wishon and the appointment of George Bigelow of the Southern Sierras Power Company as a fourth central station member of the committee.

New Big Creek Plant Authorized by Railroad Commission

Authority to proceed with the construction of an additional unit in its Big Creek hydroelectric development project has been given the Southern California Edison Company by the State Railroad Commission. The new plant will bring in 50,000 kilowatts by 1923 and the work which is to be done between now and then calls for the expenditure of $11,500,000. The present plans call for the construction of a dam across the San Joaquin River just below Big Creek. The water thus impounded will be carried through a tunnel five and three-quarter miles long to the power plant.

Increasing demand for hydroelectric power in the West is indicated by figures presented by the company. In 1913 the output of power from the system was 600,000 kilowatt hours while at the present time 1,000,000 kilowatt hours are being developed. The anticipated demand for 1923 is placed at 1,300,000 by the company.

Industrial Illumination to be Promoted in Vancouver

Industrial illumination will be immediately promoted by the British Columbia Electrical Cooperative Association of Vancouver by a special committee appointed recently. It is planned to install an industrial lighting exhibit in the Electric Building in the near future to be followed by a vigorous campaign by wholesalers acting in conjunction with local contractors. Lecture classes in the elements of industrial lighting will also be held. The committee in charge of this new field includes G. N. Gardner, Canadian Westinghouse Company, chairman; James Lightbody, B. C. Electric Railway Company; W. C. Mainwaring, Northern Electric Company; F. E. Carew, Canadian General Electric Company; W. J. Tulk, B. C. Electric Railway Company; R. E. Chatfield, secretary-manager, B. C. Electrical Cooperative Association; and J. Muirhead, provincial inspector of electric energy.

San Joaquin Company Exhibits in Fresno County Fair

The real story of hydroelectric development in California was exemplified by the San Joaquin Light and Power Corporation at the recent Fresno County Fair when the company displayed a huge airplane map of the coast line of the state from Cape Flattery to the Mexican border with power lines and hydroelectric plants marked. The highly colored picture gave a comprehensive idea of the location of the principal cities, railroads and highways together with the entire network of the lines of the San Joaquin company and the Midland Counties Public Service Corporation, a subsidiary of the former company. Power lines were shown in red with each power house blocked out in its relative location. The booth in which the picture was displayed was attractively decorated and a unique lighting scheme was devised for best showing off the picture-map. Consumers and prospective investors by the thousands visited the booth.

The booth of the San Joaquin Light and Power Corporation at the Fresno County Fair in California, showing the huge airplane picture map on which the power developments of the company were shown.

Northwest Association Chooses Technical Committees

The executive committee of the Technical Section of the Northwest Electric Light and Power Association, of which R. M. Boykin of the North Coast Power Co., Portland, is chairman, met recently to select the personnel of the various committees of the Technical Section for recommendation for appointment by President Putnam. Plans for the ensuing year's work of the committee, which will be very active, were also discussed. The most important question to be taken up and the one which will attract the most attention from the Technical Section is the matter of formulating a standard line extension policy for suggested adoption by the utilities of this section.

Chairmen of the various committees of the Technical Section were suggested for appointment as follows:

Overhead Systems Committee, R. M. Boykin, North Coast Power Co., Portland; Safety Rules Committee, H. H. Schoolfield, Pacific Power & Light Co., Portland; Electrical Apparatus Committee, G. E. Quinan, Puget Sound Power & Light Co., Seattle; Hydraulic Power Committee, J. B. Fisken, Washington Water Power Co., Spokane; Underground Committee, H. R. Wakeman, Portland Railway Light & Power Co., Portland; Prime Movers Committee, O. L. LeFever, Northwestern Electric Co., Portland; Meters Committee, R. E. Thatcher, Puget Sound Power & Light Co., Seattle; Inductive Interference Committee, F. D. Nims, Washington Coast Utilities, Seattle.

Books and Bulletins

The Induction Motor and Other Alternating Current Motors

By B. A. BEHREND. Second edition, revised and enlarged. 272 pages, 6 by 9, 212 illustrations. Published by McGraw Hill Book Co., Inc., New York.

The book is the gist of the experience of an engineer who has been actively associated with electrical engineering through almost three decades, and who has had a part in the development of the machines about which he writes. It discusses the theory and principles of design of the induction motor and other alternating current motors.

C. P. Bowie is the author of a booklet published by the Bureau of Mines, entitled **Oil Camp Sanitation.** Although ostensibly wrtten to be helpful to those engaged in coping with conditions found in "mushroom" oil towns, the treatise is a well illustrated and exhaustive study applicable to sanitary problems found in all places of temporary habitation such as construction and mining camps, or fruit districts during the harvest season.

CORRECTION TO STUDY COURSE, PAGE 311

Omission of the red imprint on some of the copies of the Journal of Electricity and Western Industry of this issue, makes necessary a correction to the illustrations on page 311, which should be noted. Under column 3 of the second illustration, "Condensed Summary of Operations," where a blank now appears against net profit of the store operations for February, $50.34 should be inserted in red and below in the tabulation representing the distribution of each dollar received from sales, against the same item should be written $.0290 in red.

Meetings of Interest to Western Men

Washington Contractor-Dealers Secede From National Body

Decision was reached at the annual convention of the Washington Association of Electrical Contractor-Dealers, held in Yakima, Washington, September 16, to follow the action of the California and Oregon Associations in withdrawing from the National Association of Electrical Contractors and Dealers. Similar action was taken at the Oregon state convention held June 12 and 13 at Eugene and at the California annual meeting held at Berkeley, August 27. A joint letter to the National Association giving notice of withdrawal was signed by the presidents of the three associations at the Yakima meeting. This action follows failure to come to an agreement over the appointment of a Pacific Coast field representative, the western associations feeling that they could not support such an institution at the present time, and as their alternative proposition was not acceptable to the national body, they have withdrawn in order to establish an organization which they feel will bring the West closer together.

The following officers were elected for the coming year: President, A. J. Gladson; vice-presidents: Seattle district, J. J. Agutter, V. S. McKenney and W. M. Meacham; Yakima district, R. B. Wiseman and Frank E. Smallidge; Spokane district, H. L. Tinling; Bellingham district, A. S. Clark; Tacoma district, David T. Dickson.

Cooperative Campaign Fosters San Jose Mass Meeting

Plans for a public mass meeting in San Jose when people of the Santa Clara Valley will listen to the story of hydroelectric development in the West were evolved at a meeting of men of the electrical industry held in that city on October 6, under the auspices of the California Cooperative Campaign. Fred Doerr, chairman of the Santa Clara Valley electrical dealers' organization, presided over the gathering of power company men, manufacturers' representatives, jobbers, contractors and dealers who attended. Among the speakers of the evening were Robert Eltringham, manager of the campaign, C. L. Chamblin, president of the San Francisco Electrical Development League, who urged the formation of such an organization in San Jose, John Kuster, district manager of the Pacific Gas and Electric Company, Earl Browne, president of the California Contractor-Dealers' Association, and Albert Elliot, San Francisco attorney.

The Southern District Contractor-Dealer Association will hold its October meeting on the 22nd at **San Diego** as a joint meeting with the Electric Club at which time the campaign will be launched to assist the power company in a local drive to sell its securities. San Diego is growing at such a rapid pace that a large program of betterments by the Company is necessary to supply the demands for service.

Municipalities League Favors State Power Development

Resolutions favoring the immediate creation of a state board of water and power commissioners to direct the expenditure of a total of $500,000,000 of state funds in developing the water resources of California were passed at the twenty-third annual convention of the California League of Municipalities held in Santa Monica September 27-30. A state amendment covering every phase of the proposed plan was drawn up by the special committee charged with this duty and the report overwhelmingly adopted at the close of two half-days of debates and arguments.

Eighty-eight official delegates from the various cities of the state together with a like number representing the legal and health departments of the cities took part in the sessions.

Gifford Pinchot, former head of the United States Forest Service, during the course of an address before the convention charged that "private operation of power plants in this state has been a glaring failure." Mayor Louis Bartlett of Berkeley and City Manager Koiner of Pasadena both presented lengthy arguments favoring state and municipal ownership and development of all utilities. All discussions urged state development of all water and power projects as well as the control through the ballot by the people of all future developments.

Delegates to the convention were conducted on a tour of the various hydroelectric developments being undertaken by the city of Los Angeles.

The convention was held in the new $375,000 municipal auditorium recently completed by the city of Santa Monica.

The keynote of the aims of all western electrical cooperative campaigns and similar activities was sounded at a meeting of men of the industry held on September 9 in Seattle when R. W. Clark, chairman of the advisory committee of the Northwest Electrical Service League said: "There are innumerable types of cooperation, ranging from that restrictive association which functions to exclude from legitimate competition those outside the organization to the cooperative group which seeks to place the average standards of its industry or profession on a higher ethical plane, to give more complete satisfaction to the consuming public, and therefore to increase the scope and service of the industry. We of the electrical and allied industries are ready to build a bigger and better service organization."

Gas Association Endorses 1925 Exposition in Portland

Endorsement of the 1925 World's Exposition to be held in Portland together with the choice of that city for its convention during that time was effected at the twenty-eighth annual convention of the Pacific Coast Gas Association held in Del Monte recently. The resolution passed by the convention follows:

Whereas, The city of Portland in the state of Oregon, has announced a World's Exposition, to be held in Portland, Oregon, in 1925, as a memorial to mark the return of peace, in commemmoration of the completion of the Atlantic-Pacific transcontinental highways and to set forth the development in the art of electricity and the development of our electrical resources; and

Whereas, We are requested and invited to endorse the action of the state of Oregon; and

Whereas, We are heartily and cordially invited by Mr. Guy W. Talbot, a director of the World's Exposition and president of the Portland Gas and Coke Company and Pacific Power and Light Company of Portland, Oregon, to hold our annual meeting of that year in that city; and

Whereas, Such great achievement as the building of the transcontinental highways and the development of our sister industry, electricity, is worthy of our endorsement,

Now, therefore, Be It Resolved, That the Pacific Coast Gas Association in annual convention assembled does hereby fully endorse the World's Exposition in Portland, Oregon, in the year 1925, and does recommend that the Association hold its 1925 Convention in the city of Portland.

Pacific Coast Division, N. E. L. A. Proposes to Change Name

Consideration of changing the name of the Pacific Coast Geographic Division of the National Electric Light Association to the Pacific Coast Electrical Association, will be the chief feature of a general meeting of that body to be held at the Hotel Del Monte, Del Monte, California, on November 11. The meeting was called in conformance with a resolution passed by the executive committee in Los Angeles on September 16. The meeting will be held in conjunction with the regular quarterly session of the Pacific Coast Division, Electrical Supply Jobbers' Association, which convenes November 10, 11 and 12.

That the effect of the coming Conference on the Limitation of Armaments will revive the business and foreign trade of America is the hope of the San Francisco Chamber of Commerce, which has passed the following resolution:

"That this Chamber of Commerce attributes the decline of our foreign trade and the reduced domestic consumption of manufactures and luxuries to excessive taxation and to the exhaustion of capital and credit. It places hope of a substantial and world-wide recovery upon the success of the Conference for the Limitation of Armaments and urges the administration to use every effort to bring about a drastic reduction of naval and military expenditure so that all countries and all classes may be relieved of a staggering burden which threatens some with insolvency and confiscation and all with trade stagnation and unemployment."

COMING EVENTS

PACIFIC COAST DIVISION, N. E. L. A., GENERAL MEETING
Del Monte, Cal., November 11, 1921

PACIFIC COAST DIVISION, ELECTRICAL SUPPLY JOBBERS' ASSOCIATION, QUARTERLY SESSION
Del Monte, Cal., November 10, 11 and 12, 1921

PACIFIC COAST DIVISION, N. E. L .A., ANNUAL CONVENTION
Riverside, Cal.—April, 1922

T. O. Kennedy, general superintendent of the Denver Gas and Electric Light Company, is the new president of the Rocky Mountain Division of the N. E. L. A. The electrical industry has few activities in Colorado in which Mr. Kennedy is not a participant . Mr. Kennedy's friends claim that it was he who saw the big possibilities of cooperative development within the electrical industry in Denver, with the result that the Electrical Cooperative Campaign was launched and Mr. Kennedy elected

T. O. KENNEDY

chairman of the advisory committee. He received his education in the University of Missouri and started as a junior engineer with the Denver Gas and Electric Light Company in 1907. Subsequently he was superintendent of various Doherty companies throughout the Middle West, until he came to Denver in 1907. He is past chairman of the Electrical Bureau of the Denver Civic and Commercial Association, a member of the Denver Athletic Club, the Denver Motor Club, the Rotary Club, and the Optimists Club, not to mention that he is active in the affairs of the Doherty Men's Fraternity, the A. I. E. E., the American Gas Association and the N. E. L. A.

Herbert Hoover, Secretary of Commerce and well known engineer of the West, has purchased a large ranch near Bakersfield, Cal., and recently had the installation of his electrical pumping plant approved by one company and turned down by another. This action is quite indicative of the lack of harmony in design of motor installations in pumping plants and emphasizes the necessity of standardization of electrical pumping installation now undertaken by the California Association of Electrical Contractors and Dealers in co-operation with the engineering committee of Pacific Coast Division N. E. L. A.

W. H. Brackenridge, senior vice-president of the Southern California Edison Company, is spending some weeks visiting eastern business centers.

N. E. Brown, assistant general manager of the San Diego Electric Company, together with **Read G. Dilworth**, general counsel for the company, and **E. J. Burns**, general auditor, were in San Francisco recently attending the rate hearings before the California Railroad Commission.

Personals

Albert H. Elliot, a San Francisco attorney well known to the electrical industry throughout the West, was the leading attorney before the Supreme Court of California who recently proved invalid the Alien Poll Tax Act, passed in the November elections last fall. He proved that the Act was not only in conflict with the treaty between the United States and Japan, but that it was void as being unconstitutional under the Fourteenth Amendment to the Constitution of the United States.

C. E. Drayer of Chicago, national secretary of the American Association of Engineers, is visiting the various chapters of the association in the West, on his annual tour of inspection. Mr. Drayer is greatly impressed by the co-operation and enterprise of the men who are making engineering history west of the Rocky Mountains. He is addressing groups of engineers in each city that he visits on problems vital to the profession.

H. Foster Bain, Director of the Bureau of Mines, Washington, D. C., and a charter member of the San Francisco Engineers' Club, addressed members of the club recently on "The Relation of the Bureau of Mines to the Oil Industry." Mr. Bain is in the West on a tour of inspection.

W. M. White, hydraulic engineer for the Allis-Chalmers Co., and designer of the water wheels for the Caribou Plant of the Great Western Power Co., is now in Japan where he is making an investigation of the interesting hydroelectric situation in Japan's new power development program.

E. P. Bacon of the Natrona Power Company, Casper, Wyoming, and **E. N. Crowley** of the Wyoming Utilities Commission, represented the Wyoming electrical interests at the recent convention of the Rocky Mountain Division, N. E. L. A., at Glenwood Springs, Colo.

W. D. Shannon of Stone & Webster, is now general superintendent in charge of the construction of the masonry dam that is being constructed for the Snow Mountain Water and Power Company. It will be remembered that he held the same post on the Caribou development of the Great Western Power Company.

J. R. Geary, general manager for the General Electric Company in Japan and well known in Pacific Coast circles, was recently the guest of honor at a dinner given by the Japanese Prime Minister in Tokyo in recognition of Mr. Geary's active work in the furtherance of peaceful relations between Japan and the United States.

C. M. Masson, illuminating engineer of the Southern California Edison Company, has been in attendance at the annual convention of the Illuminating Engineering Society at Rochester, N. Y. While in the East, Mr. Masson is making a study of the latest developments of illumination which will be of application in the West.

H. R. Wakeman, Portland Railway Light & Power Company, and **O. L. LeFever**, Northwestern Electric Company, Portland, attended the group meeting of the Technical Committees of the N. E. L. A. held at Salt Lake City recently, the latter presiding at the meeting of the Prime Movers Committee in the absence of Chairman **H. P. Liversidge**, of Philadelphia.

W. J. Barker, general manager of the Denver Gas and Electric Light Company, is president of the Electrical Home Building Company, the corporation which was formed for the construction of Denver's first electrical home. The vice-presidents are **H. D. Randall**, district manager of the General Electric Company, and **L. M. Cargo**, manager of the Westinghouse Electric and Manufacturing Company in Denver.

Harry B. Thayer, president of the American Telephone and Telegraph Company, accompanied by **Walter S. Gifford**, vice-president of the company, was a recent San Francisco visitor. The two officials are making an inspection of the company's holdings on the Pacific Coast. Mr. Thayer stated that telephone service in San Francisco was as good, if not better, than that in any city in the country.

Henry Bostwick, manager of the San Francisco district of the Pacific Gas & Electric Company, has been elected president of the Pacific Coast Gas Association. Mr. Bostwick will give to this association an unusual background of earnest effort in the upbuilding of industry in the West. For many years he has acted as secretary of the association and under the able tutelage of **John A. Britton**, one of the founders of the association, has long since been recognized as a leader in progressive

HENRY BOSTWICK

thought. His joint activities with the electrical interests of his company will also combine to give a helpful influence in the harmonious development of Gas Association activities. Mr. Bostwick is a prominent member of the Rotary Club of San Francisco, he has served as president of the San Francisco Electrical Development League, and is actively engaged in many other affairs devoted to the upbuilding of the industrial and electrical West.

J. B. Growden, recently elected chairman of the Seattle Section, A. I. E. E., is planning a big program for the Washington engineers during the coming season. Mr. Growden at the present time is electrical engineer for the City of Seattle engaged on the Skagit River power development project under the direct supervision of C. F. Uhden, chief engineer of the project. He received his engineering education at the University of Nebraska and for five years was associated with the Washington Water Power Company of Spokane. Later he held the post of superintendent of construction with both the Portland Railway, Light and Power Company and the Pacific Power and Light Company. At the outbreak of the war he enlisted in the Fourth Army Engineers, was commissioned a captain and sent overseas. He is the possessor of a most distinguished war record, being decorated for bravery in action with both the Croix de Guerre and the D. S. C. At the time of his discharge he held the commission of major.

J. B. GROWDEN

S. W. Bishop, executive manager of the Electrical Development League of Denver, is making a strong plea for the work of the electrical trade journal in putting over the cooperative idea by emphasizing the activity of the league in subscribing for and urging the membership to read the trade press. Among the outstanding electrical papers mentioned is the Journal of Electricity and Western Industry.

Frank R. Devlin, ex-president of the California Railroad Commission, has contributed a noteworthy article to the current issue of the Mining and Oil Bulletin in which he discusses "California's Attitude Towards Hydroelectric Development Programs." Although Mr. Devlin's training has been political, nowhere in his article does he suggest that the state or its subdivisions embark in the hydroelectric business in competition with and to the discouragement of private capital.

Sir Howard Wilcox, noted British construction engineer who is responsible for the vast Nile irrigation project in Egypt, has announced that he will inspect the Columbia River Basin project in Washington in the near future.

Ralph Modjeska, noted Chicago construction engineer, who with Vipond Davies, made a recent survey for a bridge across San Francisco Bay, is again in the west in the interests of the project.

F. D. Weber, electrical engineer for the Oregon Insurance Rating Bureau, Portland, and vice-president of the Board of Engineering Examiners, was the Oregon representative at the meeting of the Council of State Boards of Engineering Examiners held in St. Louis on October 3.

Willis Booth, vice-president Guaranty Trust Company of New York City, is a recent Los Angeles and San Francisco visitor. It will be recalled that Mr. Booth was formerly one of the founders of the Hotpoint Company of Ontario. He has been attending the recent bankers' convention in Los Angeles, but was called to Berkeley to be at the bedside of his mother who passed away October 3, 1921.

A. B. West, vice-president of the Southern Sierras Light and Power Company and president of the Pacific Coast Division, N. E. L. A., has contributed a timely article to the September 3rd issue of the Magazine of Wall Street, entitled, "Give Us Power." In his article Mr. West explains the demands for development in the West and how his company is meeting some of them.

Dr. Thomas A. Addison, Pacific Coast manager of the General Electric Company, is now in New York City. He expects to sail for Europe on October 22d and will be absent from his western office for some months, during which time he will visit Italy, Greece, Egypt and other countries of Europe.

Arthur Prager of the Gas and Electric Company of Albuquerque, N. M., gave his ideas on power development in New Mexico at the Glenwood Springs convention of the Rocky Mountain Division of the N. E. L. A. recently.

Max H. Heusser, metallurgical engineer for Sulzer Bros., Diesel engine manufacturers of Winterthur, Switzerland, was in San Francisco recently inspecting the various industries of that city. Mr. Heusser is making an industrial inspection of the entire U. S.

S. M. Kennedy, vice-president in charge of Public Relations for the Southern California Edison Company, is visiting in New York, Boston and other eastern centers. He will return about the first of November.

H. R. Shrofe, sales manager for Haag Brothers Co. of Peoria, Ill., manufacturers of electric washing machines, is a recent San Francisco visitor.

Mark R. Colby, president of the Colby Steel and Engineering Company of Seattle, was a recent San Francisco visitor.

New Associate Editors on the Staff of the Journal of Electricity and Western Industry

Norman S. Gallison and **George C. Tenney** have been appointed associate editors on the editorial staff of the Journal of Electricity and Western Industry. In order to give the most helpful service to the industrial West, the Journal of Electricity and Western Industry is now adding to its staff these editors experienced particularly in finance and industry. Mr. Tenney, a graduate of the University of California in Electrical Engineering, has had four years' experience in newspaper work, in which he was associated with the Sacramento Bee, the Associated Press, and the San Francisco Chronicle. He has also been in the employ of the Pacific Gas & Electric Company and the Meese, Gottfried Company of San Francisco. He will be responsible for the industrial news service in the Journal of Electricity and Western Industry. Norman S. Gallison, a graduate of the College of Commerce at the University of California, likewise with four years' newspaper experience, comes directly to the Journal of Electricity and Western Industry from the division of analysis and research of the Federal Reserve Bank of San Francisco, where he has, during the months just past, had charge of the gathering of industrial and statistical data concerning the West. He will be responsible for the financial and industrial matters appearing in the Journal of Electricity and Western Industry, in addition to his other editorial work.

N. S. GALLISON

G. C. TENNEY

Hughson & Merton of Los Angeles, Denver, San Francisco and Portland, are no longer handling the line of electric irons manufactured by the **Chicago Flexible Shaft Company**, according to an announcement from that company.

F. P. Spencer of Denver, Colo, has purchased the stock of the Clovis (N. M.) Electric Company. He will immediately replenish the stock of the store to include a full line of appliances, lamps, etc.

H. E. Bittmann, 408 Claus Spreckels Bldg., San Francisco, is now the representative of the **Holtzer-Cabot Electric Co.**, specializing in hospital signaling systems, fire alarm systems, factory calling systems and other similar devices.

The Western Agencies Corporation of Seattle, manufacturers' agents for electrical appliances, recently moved from 923 Pine street to 623 Fourth avenue.

The Electrical Equipment Company, one of the largest auto-electric concerns in the Southwest, recently opened a new $250,000 store, office building and shops at Phoenix, Arizona, said to be one of the most complete of its kind west of the Rocky Mountains. The building contains 11,000 sq. ft. of floor space of which 1000 ft. is devoted to an electric parts department. **E. L .Gielow** is president of the corporation.

G. O. Rolfe has opened a new electrical appliance store at Third and Salem streets, Chico, Cal.

L. V. Ingersoll of Otis McAllister & Company, San Francisco, left for Guatemala on October 8 where he will represent the company with a line of recently perfected electric coffee roasters.

R. C. Degner, of the Electric Service Garage, is negotiating for much larger quarters, as a result of the recent boost given to the electric trucking business. Since Mr. Degner took over the Harrison Electric Garage in the early summer, Jim Canovan of the Walker Electric Vehicle Company, and C. E. Poyer, representing Edison Storage Batteries, have combined with him, to stimulate interest in the electric truck as a money saver to the user and as a load stabilizer for power companies.

R. L. Eltringham, secretary-manager of the California Electrical Co-operative Campaign, has exemplified what a well written series of educational articles can do. He points out that $4,000 spent in advertising has gotten into the daily press of the state something like $30,000 worth of publicity through the appearance of the "Home Electrical" articles, which were written by Miss Gertrude Tucker of the Southern California Edison Company in Los Angeles, on the better uses of electricity in the home.

The F. A. Clarke Company recently opened a new electric appliance store in Pasadena, Calif., with a large line of labor saving and convenience devices which they are prepared to sell on the "Name your own terms" plan.

D. J. Butts, for the last two years a partner with **Thomas Foulkes** in the Foulkes Electric Shop, Los Angeles, has bought the full interest in the firm for himself. He will continue the business under the old name.

Manufacturer, Dealer, and Jobber Activities

General re-adjustment of prices of Mazda lamps was announced by the **National Lamp Works** of the **General Electric Company**, to be effective October 1st. The reduction affects the prices of Mazda C and Daylighting lamps.

With the resignation of Eugene Newnham as sales manager of the motor department of the **Robbins & Myers Company**, Springfield, Ohio, the following changes in the sales organization have been announced: **W. W. Mumma**, formerly sales manager of the fan department becomes general sales manager, with **A. J. Reed** assistant sales manager of the motor department and **F. W. Burmeister**, assistant sales manager of the fan department.

An improved line of "Red Spot" hangers for commercial lighting units have been issued by the **F. W. Wakefield Brass Company**, Vermilion, Ohio. Many new ideas are included in the new style hangers.

The Baby Grand Ironer, produced by the **Grand Manufacturing Company** of Detroit and distributed by **The Electric Servant Company** of the same city, is one of the newest additions to the home appliance line. The ironer, which can be placed on a table or carried from room to room, is driven by a small **General Electric** motor.

E. F. Conrad has been appointed factory western representative for the Square D Company of Detroit, Mich., and will establish his headquarters in San Francisco.

The J. A. Newton Electric Company and the **Jewel Electric Company** were both exhibitors in the September Trade Fair held in Glendale, Cal., by the merchants of that city. Every opportunity was sought to show the throngs what was really desirable in the electric appliance line. They sold the idea to the visitors that proper service for electrical goods can best be obtained by trading with contractor-dealers, thereby insuring high standard goods and a follow-up service that gives best results.

The Federal Electric Company of San Francisco has recently added a complete line of **Epco** theatrical lighting equipment for distribution in Northern California. The line includes footlights, spotlights, color spots and trip lights.

Garnett Young of Garnett Young & Company, electrical manufacturers' agents of San Francisco, left recently for an extended tour of the east. He will visit the factories of several of the manufacturers which his company represents on the Pacific Coast.

The Edison Electric Appliance Company of Los Angeles has recently issued a small pamphlet which is designed to sell the value of 24-hours-a-day service of the central station to the consumer. The pamphlet is enclosed in every appliance that is sent out by the company so that the consumer opening the package gets the message on the value of central station service.

The Humphrey Engineering Construction Company of Los Angeles was awarded two ornamental street lighting contracts in the last few weeks. One installation in the Crescent Heights district calls for 360 single light standards with series circuits. The other contract calls for the city of Inglewood and amounted to $10,799.

The electrical work on the new Logan Heights high school, San Diego, was awarded to the **Southern Electric Company** at a figure said to be around $17,000. It is to be one of the most complete electrical installations to be made in California schools and the Southern Company deserves much of the credit for establishing such high standards in the Southwest.

M. W. Wheeler, western representative for Airway Electric Appliance Corporation, Toledo, manufacturers of Airway electric vacuum cleaners and washing machines, has removed from the Builders' Exchange Building to 373 Monadnock Building, San Francisco.

Milton Birnbaum has taken the position of secretary with the **Federal Electric Company** of San Francisco. Mr. Birnbaum was for five years with the Novelty Electric Sign Company and later with J. Charles Greene Company and Foster and Klieser, outdoor advertisers. Mr. Birnbaum was the designer of the monster "Wrigley" electric sign, one of the most pretentious on San Francisco's big White Way.

JUST BEFORE HOOKING ONE

S. B. Gregory, Pacific Coast representative for the Arrow Electric Company with offices in San Francisco, has just made a beautiful twenty-five yard cast with the fishing rod he holds in his hands. He is hoping to catch either a birdie or an eagle if there are such fish. Note the placid waters of Lake Bunker in the background. Judging from the smile on "Greg's" face, one might think that he has just made a "hole-in-one" from the second tee at the Claremont Country Club.

Business Outlook in Western Market Centers

Reflecting the Trend of Community Thought on Conditions and Events Affecting Business and Industrial Activities Throughout the West

Compiled and edited for the Journal of Electricity and Western Industry by correspondents in all principal Western cities.

SAN FRANCISCO

The outlook for business is favorable, the impression being general that recovery from the depression of past months is in progress. Barring unforeseen contingencies, steady improvement is expected.

The employment situation is considerably improved, partly due to the fact that the building trades strike has been settled and that a large percentage of labor has returned to work. Some factories, noting a larger demand for their output, are increasing their forces. There is still a good deal of unemployment, however.

There is now considerable building activity. Material dealers have cooperated toward the lowering of prices, and, with the settlement of the strike, all unfinished jobs are again under way. The general opinion is that there will be a good deal of home building this winter.

LOS ANGELES

Business and crop conditions are fairly satisfactory, with prospects favorable. A significant factor is the growing demand for building sites, and new building continues upon a very large scale. Six representative department stores here report an increase of 4 per cent net in August sales over August, 1920, while in August this year sales were 29.3 per cent larger than in July.

The tonnage that entered Los Angeles harbor in August was 314,998 tons net, and 350,795 tons cleared this port. August exports totaled $1,067,263, against $432,503 in August, 1920, imports were $1,114,615, against $448,991 for August last year.

State and National banks report a combined increase of $28,773,961 in deposits and an expansion in loans of $33,361,711 in their report of September 6. The largest proportion of this is credited to the State banks, their deposits amounting to almost $300,000,000.

SALT LAKE CITY

There are unmistakable signs of improvement in the general business situation in the intermountain section. Building permits in Salt Lake City for the month of September showed a gain of 320.7 per cent over the month of September, 1920. The permits totaled $230,635 as compared with $56,845 a year ago.

Reports from the silver and lead producers indicate that they are fairly busy, particularly in the mining of silver ore. The price of lead has advanced 30 points within the last thirty days.

Local bankers report that the demand for money has not diminished, and that stockmen are endeavoring to borrow money to enable them to hold their sheep and cattle for winter feeding.

Crops have been exceptionally good this year, and the unemployment situation has been relieved to a considerable extent due to seasonal industries such as sugar making and canning.

DENVER

Business in all lines is showing improvement. Evidence of this condition is revealed in the statement on state banks made public just recently by the state bank commissioner. This report shows that individual deposits in the state banks were $44,146,133.36 on Sept. 6 compared with $40,972,760.97 on June 30. At the same time loans and re-discounts showed a decrease of $2,200,000.

Building is on the increase in Denver as is shown by a report just issued by the city building department. In the first nine months of 1921, the report shows that building permits were issued for a sum more than $1,000,000 greater than for the same period in 1920. Indications are that the present year will eclipse any other twelve months for at least ten years in the building business here.

Coal mining in Colorado at this time is more nearly normal than it has been for some little time as people are again buying coal for domestic use. A slight increase is also reported in industrial consumption. Merchants in all lines of business are of the opinion that the worst of the depression is over and that conditions will continue to grow better.

SPOKANE

The month of September just passed exceeded any September in ten years in the number of permits issued for home building. The total construction will amount to approximately $150,000 with $23,000 added for additions, repairs and alterations to present buildings. The nearest approach was in 1912 when the new construction totaled approximately $90,000 in value and work on old houses $12,000.

Most lines are showing some degree of improvement with the exception of mining and allied business. While the farmers in this district do not find the process of liquidation an entirely pleasant one, conditions continue to show an improvement which first began to be marked some weeks ago. The lumber trade which has been stationary for months past is now improving. Cedar products are more in demand with a noticeable rise in prices. The price of the higher grades of fir lumber has risen $5 per thousand feet and lumbermen are inclined to be optimistic over the present market outlook. Improvement in the local building situation and in eastern centers, which absorb the bulk of the lath manufactured in this district, is reflected by an increased demand.

SEATTLE

No increase is reported in the volume of business transacted by local jobbers and dealers compared with last month. Stocks are reported ample, adequate by a considerable margin for the present demand; deliveries are easily obtainable and collections range from fair to good.

A majority of lumber mills in this section are operating steadily and present indications are that the tidewater mills, at least, will continue throughout the winter months. A recent stiffening in the price of certain grades of lumber, reduced water rates and like contributing factors have speeded up lumber production in the Puget Sound district. A majority of the logging camps in western Washington which have been closed down or running intermittently since early summer, are now operating with full crews.

A considerable amount of new construction is going on in Seattle, the major portion being confined to residence work and the smaller type of industrial and business buildings, although there is at present considerable projected construction which is being delayed awaiting the ability of owners to finance their undertakings.

PORTLAND

Indications of better times are evident in a general quickening in industrial lines. Building is steadily increasing, while an increase in bank clearings indicates better business conditions. The lumber industry is in better shape than it has been for nearly two years, exports are large and on the increase.

Slow but steady gains are reported in most retail lines. Country orders received by jobbers are in larger volume, and reports from the agricultural sections, particularly the grain growing districts, are more encouraging. Wheat money is beginning to circulate more extensively in the interior and is doing much to improve the financial situation there.

Builders' hardware, plumbing supplies and electrical wiring equipment are all experiencing considerable activity due to residence building work. Electrical jobbers report that orders are coming in for standard package quantities, which indicates a more active demand for goods, as well as a general feeling that prices are becoming more nearly stabilized.

Construction News and Industrial Developments

Suggesting to the Engineer, Contractor, Manufacturer, Dealer, Agent and All Business Men Opportunities for New Business

THE PACIFIC NORTHWEST

SEATTLE, WASH.—Plans for the $1,500,000 bascule bridge at Spokane street indicate that bids will be called for by January 1.

SEATTLE, WASH.—It is estimated that the proposed sewer in West Seattle will cost $124,-913. Final plans will be prepared shortly.

HOQUIAM, WASH.—The city engineer has been instructed to call for bids for the installation of a boulevard lighting system on 8th and I streets.

BEND, ORE.—Harney Valley will hold a bond election on October 18 for voting upon the proposed $2,000,000 dam and irrigation project on the Silvies River.

SEATTLE, WASH.—Opening of bids for the construction of structural steel emergency dams for Lake Washington ship canal locks has been postponed until October 22 by U. S. Engineer's office.

PORTLAND, ORE.—A decision has been reached to enlarge municipal terminal No. 1 with a 955-ft. addition to cost $100,000. City engineers are preparing the plans and specifications.

HAMILTON, MONT.—It is estimated that from $500,000 to $800,000 will be required to reconstruct and improve the Bitter Root irrigation district canal system here, according to Major Power, of Seattle.

WALLA WALLA, WASH.—Geo. F. Judd of the Dalles-Kings Products Co., on a visit here, announced that he will return here later to look up fruit figures with the view of establishing a dehydration factory here.

RICHLAND, WASH.—Richland will soon be out of water because of the decision announced by the Horn Rapids Irrigation Co. that they will shut down their water works, due to the fact that it has not been paying for some time.

SEATTLE, WASH.—To avoid the necessity of issuing bonds, A. Lindsay, water superintendent, has been asked to spread his estimate of $268,000 for water improvement over three years, starting with the most essential in 1922.

ELLENSBURG, WASH.—J. N. Newman of Thorp appeared before the county commissioners asking that the Yakima river be returned to its course by building a dike. Irrigation ditches are being destroyed by the change in the river's course.

SEATTLE, WASH.—Plans are being considered by the street department for the construction of a concrete and steel trestle, one-half mile long, to replace the present wooden bridge over the Argo railroad yards on First Avenue. Estimated cost is $750,000.

SPOKANE, WASH.—O. L. Stevens, western representative for the L. R. Steele Service Corporation, has announced that $2,000,000 will be spent by that company during the coming year for the erection of buildings in seven cities of this state. Spokane's allotment is $500,000 of this sum.

SEATTLE, WASH.—President Geo. W. Merrick of Merrick Co., Yakima, is desirous of getting in touch with contractors who are at present in a position to assume at least a portion of the Horse Heaven irrigation district bond issue as a basis on which contracts can be secured. The Merrick Co. has options on certain cost bonds in connection with a $25,-000,000 project.

SPOKANE, WASH.—The Arctic Pump Manufacturing Company has been incorporated here by G. B. Kemp and R. S. McClintock. The company will manufacture all kinds of mechanical and electric pumps and cooling appliances.

THE PACIFIC CENTRAL DISTRICT

AUBURN, CAL.—George Fisher is planning to erect a building and a number of dehydrators for his fruit drying business.

GRASS VALLEY, CAL.—Three camps have been established for the surveyors at work on the distributing system of the Nevada Irrigation District.

SACRAMENTO, CAL.—Plans for a $23,860 factory, to be erected by Chas. H. Lomery at the rear of 1128 B street, have been received by the building inspector and a building permit issued.

EXETER, CAL.—At a meeting of the trustees Sept. 21, arc lights were ordered installed at different points in the city. This will make Exeter one of the best-lighted cities in the valley.

IRVINGTON, CAL.—Surveys preliminary to the grading and first construction work of the Reid Bros., Inc., $250,000 hospital supplies manufacturing plant to be built here were made by engineers of the company.

OAKLAND, CAL.—The Great Western Meter Company will invest $125,000 in a plant at the corner of Powell and Beaudry streets, Emeryville. They will manufacture two types of irrigation and gasoline meters.

OAKLAND, CAL.—The Parr Terminal Co. reports that the American Petroleum Co. contemplates investing $20,000 in a plant on the Parr Terminal property for importing and exporting mineral and vegetable oils.

NORTH SACRAMENTO, CAL.—G. Hunter, acting for the American Brooder Company, will erect a brick building 60 x 90 feet on an acre tract at the junction of Del Paso and Auburn Boulevards, for the manufacture of brooders.

SAN FRANCISCO, CAL.—J. L. Craig, interested with Edward Munford, William George Loomis and W. Sam Clark in the Clarkadota Fig plantations, assounces that within the year a $300,000 fig cannery may be built in Stockton.

OAKLAND, CAL.—The Bay Belting Company of San Francisco, E. W. Bosworth, president, O. L. Hoffmeyer, superintendent, have announced the purchase of property at 520 Broadway, Oakland, where they will construct a plant at once.

FORT BRAGG, CAL.—The American Car Equipment Co. has been formed with J. A. Pottis as president and C. D. DeMar, manager, for the manufacture and marketing of a new brake tester. No site has yet been selected for the plant.

MODESTO, CAL.—A resolution authorizing formation of the El Soyo irrigation district, comprising about 4,000 acres in western Stanislaus county, was adopted by the supervisors. Roy N. Pike director; C. B. Smith, assessor, collector and treasurer.

FAIROAKS, CAL.—That $1,000,000 will be required for the purchase of the system of the North Fork Ditch Co. and improvements desired in Sacramento county irrigation districts, is announced. It is proposed that 24,000 acres of land be watered under the plan.

SAN FRANCISCO, CAL.—Radio fog signal plant is to be installed in San Francisco, being the only one of its kind on the coast.

SOUTH SAN FRANCISCO, CAL.—The Fontana Food Products Company, manufacturers of macaroni, have secured a site of land near the Southern Pacific Railroad and will erect a Class A reinforced concrete plant to cost about $500,000. M. E. Fontana is president.

PETALUMA, CAL.—At a mass meeting Sept. 26 the plan of the city council to purchase the property of the Petaluma Power and Water Company and to build another reservoir to provide a capacity of 659,000 gallons for the year, was approved. The entire cost will be $722,000.

SAN LEANDRO, CAL.—The Oakmoor Improvement Club, Frank V. Boll, president, petitioned the city trustees to establish a lighting district for the erecting and equipping of electroliers in the Broadmoor section. Four hundred electroliers would be required, estimated cost, $60,000.

TURLOCK, CAL.—Sealed bids will be received until 10 a.m. November 1st, by the board of directors of the Modesto and Turlock irrigation districts, Turlock, for the furnishing and delivering of complete electrical equipment for a 15,000-kva. plant, consisting of three units of 5,000 kva. each.

BRIDGEPORT, CAL.—A company incorporated by W. S. Wentworth of Alameda, George C. Holbrook of San Francisco and Leonard E. Wing of Sacramento, plans to establish a plant at Mono Lake, Mono county, for the extraction of mineral salts from the water; capital stock, $150,000. Sacramento will be the principal place of business.

RICHMOND, CAL.—The United States Electric Co., represented by A. P. Gillies of San Francisco, is looking for a site here to establish a plant for the manufacture of steel by electric processes. The company would provide its own power and would use ore from deposits on the coast and in South America. The plant would provide employment for about 5000 men when completed.

SACRAMENTO, CAL.—Chas. E. Virden, president of the Virden Packing Co., has announced that a large plant for the cooling, smoking and distribution of packing house products for northern California will be erected immediately at Fifth and R streets, Sacramento. The building will be reinforced concrete, costing approximately $150,000. McGillivray Construction Co. are the contractors.

SAN FRANCISCO, CAL.—Further extension of the municipal railway lines to include the one now terminating at Grafton and Brighton avenues, into Ocean View, has been provided for by the board of supervisors with an appropriation of $110,000. The extensions already provided for with appropriations are: Haight and Ashbury, $200,000; Sunset, $500,000; Taraval avenue or Parkside, $150,000.

SAN FRANCISCO, CAL.—Plans are being made by the Engineering Department of the Pacific Gas & Electric Company for the following work: Construction of a steel frame and concrete substation on Lake Temescal, Claremont, estimated cost, $20,000; construction of a steel frame and concrete substation at 50th Ave., Melrose, Oakland, estimated cost, $20,000; and construction of a steel frame and concrete substation at Newark, Alameda county, to cost $20,000.

GILROY, CAL.—At the meeting of the city council held Sept. 19 the following resolution was passed: That the electric light and power plant belonging to the city of Gilroy, and the gas generating and distributing system of the city of Gilroy, be sold and the proceeds devoted to making improvements and extensions of the water system and sewer system.

OAKDALE, CAL.—The Pacific Asbestos Company has been organized to take over the mountain of asbestos located 15 miles from Oakdale. It is planned to erect a large mill at the mine, to separate the rock from the asbestos, and it will then be baled for shipment from Chinese. The company is considering the erection of a plant in Oakdale for the manufacture of asbestos products.

THE PACIFIC SOUTHWEST

EAGLE ROCK, CAL.—The bond issue for a new city hall has been voted and plans will be drawn at once. A total of $35,000 is available for the building and equipment.

INDEPENDENCE, CAL.—The Owens Valley school district is having plans prepared for a school building to cost $35,000. Wm. H. Weeks of San Francisco is the architect.

LONG BEACH, CAL.—Contract for a new factory building for the Golden Gate Woolen Mills at 17th and Nadeau Ave. has been awardd to the Long Beach Brick Co. for approximately $130,000.

BAKERSFIELD, CAL.—It was reported that an irrigation project to cost $21,000,000 and to serve 90,000 acres is being promoted in the Indian Wells valley, 110 miles northeast of Bakersfield.

SAN DIEGO, CAL.—Miller and Eddleman, local contractors, were awarded the contract for the junior high school. The general contract bid was $277,800 and called for an immediate start on the work.

PHOENIX, ARIZ.—Additions and remodeling contemplated by the Mountain States Telephone & Telegraph Company will call for the expenditure of $95,000. G. E. Walker Construction Co. is the contractor.

LONG BEACH, CAL.—The California-Mexico Oil and Refining Company will start work in October on its oil refining plant. Vern Dumas is quoted as saying the company will spend $450,000 on the project.

EL CENTRO, CAL.—Imperial Ice and Cold Storage Company have given the contract for their new ice plant to C. M. Gay and Son of Los Angeles. The total cost of buildings and machinery will be $250,000.

GLENDALE, CAL.—At a Chamber of Commerce luncheon recently, Geo. B. Carr, president of the Baldwin Shirt Co. of Parsons, Kan., announced that he had selected a site for a branch factory at Glendale.

TUCSON, ARIZ.—Definite plans to proceed with the new high school were made and Lyman, Place and Jaastad, architects, will prepare the plans. The bond issue calls for $750,000 to be used for this purpose.

SAN FERNANDO, CAL.—The Big Pine Fertilizing Company contemplates the erection of a factory on seven acres of land located at Hubbard and Porter Avenues. George W. Abels, Los Angeles, is manager.

VENTURA, CAL.—Sanford Butts, of the Chamber of Commerce, has received, through the agency of Gabbert, Moore & Dingham, a communication from an insulating material manufacturing company which wishes to locate here.

LOS ANGELES, CAL.—A three-story fireproof addition to the County Hospital will be made. Plans include electric elevators, refrigerating plant and other equipment not in general contract. The total cost is estimated at $300,000.

ANAHEIM, CAL.—A total of $50,000 in bonds was voted for the improvements of the water system. The work will provide for a new well, motor-driven pump and extensions to the mains.

WILMINGTON, CAL.—A new building to house the administration and laboratory departments of the Union Oil Company will be erected under the supervision of the company's engineers. The structure will cost $256,000 when completed.

LONG BEACH, CAL.—Long Beach Petroleum Association is considering plans for establishing a refinery with capacity of 5,000 bbls. of crude oil. A 12-acre site has been secured in the local harbor, it is reported, adjacent to railway and dockage facilities.

LONG BEACH, CAL.—Ocean Boulevard will have a nine-story apartment with 58 two, three and four-room suites. Automatic electric elevators, refrigeration machines and other special equipment will provide for exceptional service as a family hotel.

LOS ANGELES, CAL.—Construction of the Pacoima and San Gabriel dams will follow the completion of the Devil's Gate dam, according to C. J. Burnham, engineer with the Los Angeles county flood control district. The Pacoima dam will cost $1,500,000.

MERCED, CAL.—The city trustees have adopted plans for the big ornamental street lighting system. The final decision was for marblite posts and with the completion of the work will cost $300,000. It is contemplated that 460 posts will be installed at this time.

LOS ANGELES, CAL.—Approximately $600,000 will be expended in a new ice cream plant which will have a capacity of 100,000 gallons daily, and refrigerated storage for 20,000 gallons. W. A. Heitman Construction Company is the contractor for the Keeler-Comey Company, owners.

PHOENIX, ARIZ.—The Los Angeles office of the Santa Fe Railway is asking for bids on the new union depot for this city. Mission architecture will be followed throughout. Part of the building will be two stories and the front will have an arcade 250 feet in length. The cost will approximate $275,000.

MERCED, CAL.—Manager Warner of the Merced Irrigation District, announces that his board of directors contemplates the purchase of the Crocker-Huffman irrigation system and rebuilding a portion of the system to increase its capacity, and an extension, the whole project to involve an expenditure of $4,535,000.

PHOENIX, ARIZ.—Plans for the construction of an earth-filled dam, unanimously agreed upon by engineers representing parties interested in the control of the Case Creek flood menace, will be presented to the board of engineers by a committee appointed to formulate plans. City Engineer L. B. Hitchcock was selected as permanent chairman.

LOS ANGELES, CAL.—Construction of a $1,000,000 plant and centralized executive offices from which Pacific Coast and transocean orders will be taken care of, etc., will begin soon for the Westinghouse Electric & Manufacturing Co., on San Pedro St. between Fourth and Fifth Sts., as announced by K. E. Van Kuran, local district manager. A site for a plant has also been selected in San Francisco.

MERCED, CAL.—The Merced city trustees have adopted plans and specifications for a complete electrolier lighting system, estimated cost $300,000. The plans call for 460 electroliers of marblite, with high power lamps.

LOS ANGELES, CAL.—A. A. Comey announces that plans are under way for the erection of a new ice cream manufacturing plant, to cost approximately $700,000. The plant will be owned and operated by a company headed by W. E. Keller, president of the Globe Milling Co.; Mr. Comey will have personal direction of the factory.

LOS ANGELES, CAL.—The Davis Radio Signal Co. has recently incorporated with a capital stock of $25,000; directors, Chas. L. Davis, Victoria Davis, and Louis Gastineau.

LOS ANGELES, CAL.—Sealed bids will be received up to 11 a.m., Oct. 17, by the Board of Supervisors for furnishing and installing engine generator set with necessary piping and wiring for engine room in the county hospital, in accordance with specifications on file in their office.

NATIONAL CITY, CAL.—The California Gypsum Company has applied to the State Harbor Board for a lease of 40 acres of National City tidelands, for the purpose of erecting a gypsum factory to cost $250,000—railroad tracks to be laid, pier enlarged, and channel to be dredged. It is reported a railroad will be constructed from the gypsum mountain to a point on the San Diego, Arizona Railroad between Dixie Land and Coyote Wells, and large equipment installed at the reduction plant. Work is expected to start within 30 days.

THE INTERMOUNTAIN DISTRICT

SALT LAKE CITY, UTAH.—The Rio Grande shops are now employing 900 men, which is nearly their normal figure. Steady work is in prospect, with a large number of locomotives and cars on hand for repair.

BOISE, IDA.—The Mountain States Telephone & Telegraph Company, at a recent conference of officials held at Boise, has decided upon the expenditure of $400,000 in southern Idaho on the system's lines and exchanges.

OGDEN, UTAH.—Electrical equipment to be used in the manufacture of flour is being installed at the Globe Grain and Milling Company's mills in West Ogden. It is anticipated that the plant will be placed in operation about January 1.

DILLON, MONT.—The federal power commission granted a license to the Rock Creek Power Co. of Missoula to build a diversion dam, a three-mile conduit of open cut flume and wood stave pipe construction, and power house operating under 6.6 ft.

WABUSKA, NEV.—A huge deposit of Iceland spar used in manufacture of surgical instruments and high grade glass, has been discovered in the hills seven miles north of Wabuska. The owners are preparing to sink several fifty-foot shafts and block out the product preparatory to shipment.

SALT LAKE CITY, UTAH.—The Bennett Glass & Paint Company, 67 West First South street, is erecting a five-story building immediately east of its present property, to cost $30,000, for use in connection with the company's present business. It will be ready for occupancy in the early spring.

ST. ANTHONY, IDA.—The new Wright potato storage plant, which is the largest of its kind in the intermountain country, has just been completed. The Wright firm contemplates the erection of three other large plants next spring. Three other concerns also contemplate entering the field next year.

DELTA, UTAH.—The lines of the Deseret Power Company and the Telluride Power Company have been connected, and Delta is now receiving its electrical energy from the Telluride company. H. A. Lawrence is making preparations to greatly increase the service and a number of new lines are to be built into the various communities.

ST. ANTHONY, IDA.—A meeting of mayors and city councilmen of Rexburg, St. Anthony, Idaho Falls and Ashton was held recently for the purpose of considering the feasibility of establishing a joint municipal power plant to serve these communities. Committees were appointed to investigate sites and consider other details in connection with the proposition.

NEWS SELECTED FOR OUR READERS

Special churches for the deaf are to be provided in Hanover, England. They will be provided with a telephone transmitter, into which the preacher directs his voice, together with from 50 to 100 receivers to be worn on the worshiper's heads.

* * *

A crusade against the parking of chewing gum on the seats of moving picture theatres and other public places has been launched by the police force of Klamath Falls, Oregon.

* * *

It is calculated that 165,000 tons of soot falls on London every year as the result of the combustion of the 17,000,000 tons of coal Londoners annually consume.

* * *

Unprecedented activity is reported in the marble market, owing to the fact that the past year has seen the greatest demand for soda-water fountains and their accessories in the history of the trade.

* * *

Electrical vibrations are credited with being responsible for all earth's diseases, by a writer to a local paper. The influenza started, he points out, in the Himalaya mountains, the highest in the world and probably the most subjected to electrical storms. The plagues have all come west, against the rotation of the earth, the reason being that the atmosphere lags a little, thus bringing one place after another in contact with this electrically generated freak current.

* * *

Electrical fans installed in the barn of a California ranch are credited with increasing the milk output, in some cases as high as twenty additional pounds of milk per cow.

* * *

A Substitute for the Movies

A recent item states that wireless telephony is to be given a tryout in Chicago's police system. Sending apparatus with four antennae capable, when working in combination, of sending 1000 miles, will be installed on the roof of the city hall.

To begin with, receiving sets will be installed on two fire boats, two lake cribs, two fire engine houses, two police stations, the Englewood fire alarm office, two patrol wagons, and two of the fast automobiles of the detective bureau.

Sound amplifiers at the receiving stations will be sufficiently strong to permit the voice at the central station to be heard from 50 to 100 ft. from the horn-shaped receiver, and the voice of the person at headquarters giving information about the latest crime will be heard above the exhaust and noise of a speeding automobile.

We anticipate a protest from the newspapers. What are the "extras" going to do for headlines when all the small boys of the neighborhood, lined up hungrily within range of the amplifier, have already spread the luscious details far and wide?

STRANGE COINCIDENCES

Mr. Brown was run over on Market Street by a Ford automobile. Strangely enough this is the make of machine which Mr. Brown himself possesses.

* * *

Mr. Jones ordered fish for lunch on Friday and on arriving home that evening found that his wife had prepared fish for dinner as well!

* * *

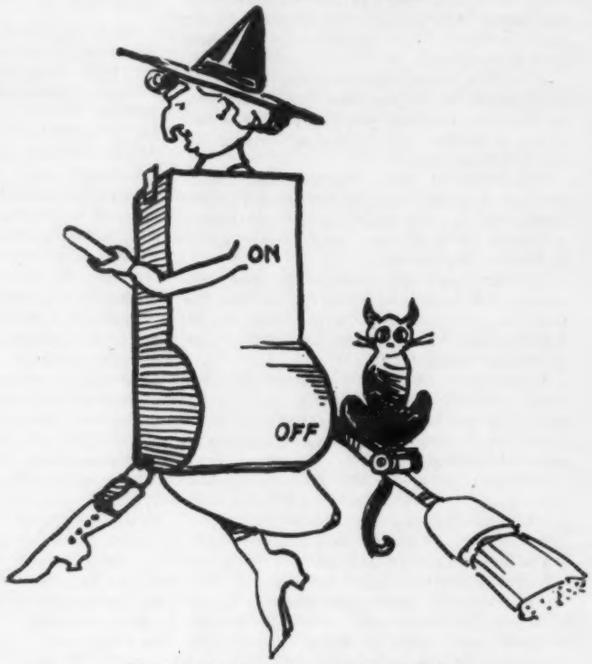
Both Mrs. Smith and Mrs. Green tried to telephone each other at exactly 3 p. m. By a strange coincidence central told both of them that the line of the other one was busy.

* * *

The hero and the heroine on the Atlantic liner discover that both are going to the same place—America.

* * *

ELECTRICAL HYBRIDS



XIV — The Electric Safety S-witch

The switches which switch off the power by night
And turn on the current by day
Are mysterious witches, which is, you might say
Of a governing class making light.

When they're "on" to what's moving, they work at high pitch
And yet sometimes they're "off" like a flash.
They are safe and to work them is no longer rash—
If you know, that is, which switch is which.